

MATHEMATICS 24


BANKING - SAVINGS AND CHEQUING ACCOUNTS

UNIT 3



**Distance
Learning**

Alberta
EDUCATION



Digitized by the Internet Archive
in 2016 with funding from
University of Alberta Libraries

<https://archive.org/details/mathematics2403albe>

W e l c o m e



Distance Learning

You have chosen an alternate form of learning that allows you to work at your own pace. You will be responsible for your own schedule, for disciplining yourself to study the units thoroughly, and for completing your units regularly. We wish you much success and enjoyment in your studies.

ALL RIGHTS RESERVED

Mathematics 24 Student Module Unit 3 Banking – Savings & Chequing Accounts Alberta Distance Learning Centre ISBN No. 0-7741-0796-0

Copyright © 1990, the Crown in Right of Alberta, as represented by the Minister of Education, Alberta Education, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2. All rights reserved. Additional copies may be obtained from the Learning Resources Distributing Centre.

No part of this courseware may be reproduced in any form, including photocopying (unless otherwise indicated), without the written permission of Alberta Education.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this has not been done, please notify Alberta Education so appropriate corrective action can be taken.

m5####

General Information

This information explains the basic layout of each booklet.

- **What You Already Know and Review** are to help you look back at what you have previously studied. The questions are to jog your memory and to prepare you for the learning that is going to happen in this unit.
- As you begin each **Topic**, spend a little time looking over the components. Doing this will give you a preview of what will be covered in the topic and will set your mind in the direction of learning.
- **Exploring the Topic** includes the objectives, concept development, and activities for each objective. Use your own papers to arrive at the answers in the activities.
- **Extra Help** reviews the topic. If you had any difficulty with **Exploring the Topic**, you may find this part helpful.
- **Extensions** gives you the opportunity to take the topic one step further.
- To summarize what you have learned, and to find instructions on doing the unit assignment, turn to the **Unit Summary** at the end of the unit.

- The **Appendices** include the solutions to **Activities (Appendix A)** and any other charts, tables, etc. which may be referred to in the topics (**Appendix B**, etc.).

Visual Cues

Visual cues are pictures that are used to identify important areas of the material. They are found throughout the booklet.

An explanation of what they mean is written beside each visual cue.



Key Idea

- flagging important ideas



Another View

- exploring different perspectives



Solutions

- correcting the activities



Extra Help

- providing additional study



Extensions

- going on with the topic



What You Have Learned

- summarizing what you have learned



What You Already Know

- reviewing what you already know



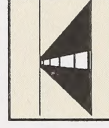
Review

- studying previous concepts



Introduction

- introducing the unit



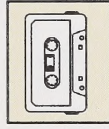
What Lies Ahead

- previewing the unit



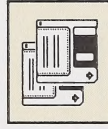
Exploring the Topic

- actively learning new concepts



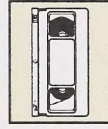
Audiotope

- learning by listening to an audiotope



Computer Software

- learning by using computer software



Videotope

- learning by viewing a videotape



Print Pathway

- choosing a print alternative



Calculator

- using your calculator

Mathematics 24

Course Overview

Mathematics 24 contains 8 units. Beside each unit is a percentage that indicates what the unit is worth in relation to the rest of the course. The units and their percentages are listed below. You will be studying the unit that is shaded.

Unit 1 Work - Getting Paid	14%
Unit 2 Work - Income Tax	10%
Unit 3 Banking - Savings and Chequing Accounts	13%

Unit 4 Banking - Borrowing Money and Using Credit Cards	11%
Unit 5 Transportation - Owning a Vehicle	8%
Unit 6 Transportation - Travelling	8%
Unit 7 Accommodation	20%
Unit 8 Cost of Independence	$\frac{16\%}{100\%}$

Unit Assessment

After completing the unit you will be given a mark based totally on a unit assignment. This assignment will be found in the Assignment Booklet.

Unit Assignment - 100%

If you are working on a CML terminal your teacher will determine what this assessment will be. It may be

Unit assignment - 50%
Supervised unit test - 50%

Introduction to Banking - Savings and Chequing Accounts

This unit covers topics dealing with Banking - Savings and Chequing Accounts. Each topic contains explanations, examples, and activities to assist you in understanding banking - savings and chequing accounts. If you find you are having difficulty with the explanations and the way the material is presented, there is a section called **Extra Help**. If you would like to extend your knowledge of the topic, there is a section called **Extensions**.

You can evaluate your understanding of each topic by working through the activities. Answers are found in the Solutions in the **Appendix**. In several cases there is more than one way to do the question.

Unit 3 Banking - Savings and Chequing Accounts

Contents at a Glance

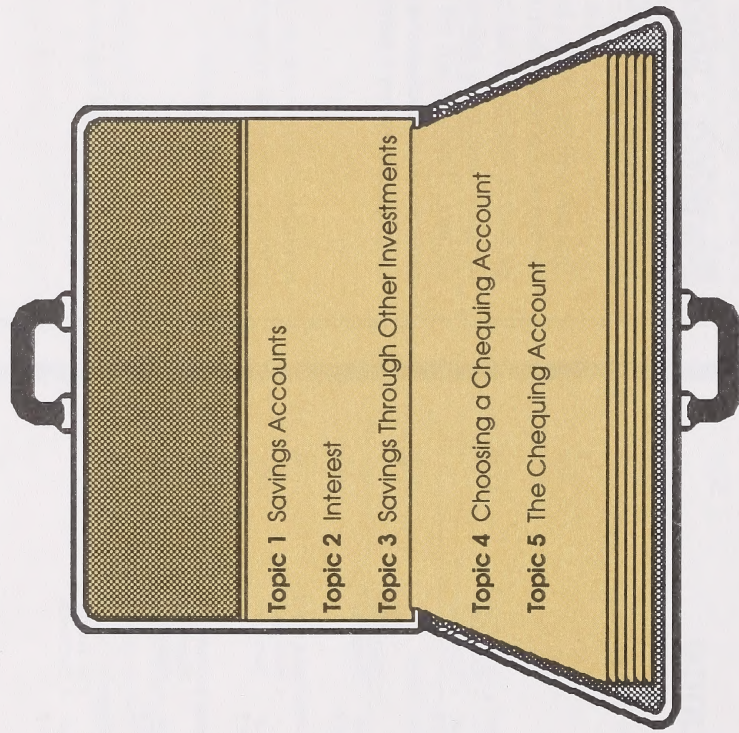
Value	Banking - Savings and Chequing Accounts	3
	What You Already Know	5
	Review	6
5%	Topic 1:	7
	Savings Accounts	
	• Introduction	
	• What Lies Ahead	
	• Exploring Topic 1	
	• Extra Help	
	• Extensions	
40%	Topic 2:	29
	Interest	
	• Introduction	
	• What Lies Ahead	
	• Exploring Topic 2	
	• Extra Help	
	• Extensions	
10%	Topic 3:	48
	Savings Through Other Investments	
	• Introduction	
	• What Lies Ahead	
	• Exploring Topic 3	
	• Extra Help	
	• Extensions	
5%	Topic 4:	65
	Choosing a Chequing Account	
	• Introduction	
	• What Lies Ahead	
	• Exploring Topic 4	
	• Extra Help	
	• Extensions	
40%	Topic 5:	75
	The Chequing Account	
	• Introduction	
	• What Lies Ahead	
	• Exploring Topic 5	
	• Extra Help	
	• Extensions	
	Unit Summary	94
	• What You Have Learned	
	• Unit Assignment	
	Appendix	95

Banking - Savings and Chequing Accounts

This unit will deal with a branch of banking which involves two types of accounts held by most people. Most bank customers will have a savings account during their lifetime. At the same time, many individuals find a need for a chequing account. This unit will tell you why two kinds of bank accounts are needed, and it will also illustrate the main differences between a savings account and a chequing account.

Unit 3

Banking - Savings and Chequing Accounts





What You Already Know

Recall the following information.

1. • Annually means "once a year."
• Semiannually means "twice a year."
• Quarterly means "four times a year."
2. 12% means $\frac{12}{100}$ which is 0.12 in decimal form.
3. $4\frac{1}{2}\%$ means $\frac{4\frac{1}{2}}{100}$ or $\frac{4.5}{100}$ which is 0.045 in decimal form.
4. 7 months is $\frac{7}{12}$ of a year.
5. 74 days is $\frac{74}{365}$ of a year.
6. Interest is money you earn for permitting the bank to use your money.
7. rounding numbers
8. adding decimals
9. subtracting decimals
10. multiplying decimals

11. dividing decimals
12. changing fractions to decimals
13. working with percents
14. changing percents to decimals

Now attempt the following review questions. If you experience any difficulty, go to Mathematics 14, Unit 1 for a more extensive review.



Review

1. Change each of the following percents to decimal form.

- a. 10%
- b. 1%
- c. $7\frac{1}{2}\%$
- d. $15\frac{3}{4}\%$

2. Change each time period into years.

- a. 6 months
- b. 70 days
- c. 18 months
- d. 360 days

3. Round each number to 2 decimal places.

- a. \$57.936
- b. \$1570.413
- c. \$7.935

4. Add or subtract the decimal numbers below.

- a. $\$145.36 + \$57.25 + \$118.76$
- b. $\$1760.45 - \$59.31 + \$1.74 - \0.38
- c. $\$889.75 - \$51.24 - \$118.70 + \26.25

5. Multiply or divide as indicated. Round your answer to the nearest cent.

- a. $\$7.83 \times 12$
- b. $\$1546.18 \div 12$
- c. $\$52.49 \times 8$
- d. $\$18.18 \div 4$

6. Change each fraction to a decimal.

- a. $\frac{4}{5}$
- b. $\frac{2}{3}$
- c. $\frac{12}{21}$
- d. $\frac{1}{6}$

7. Find 15% of 40.

8. Find 24% of 80.

9. Change each decimal numeral to a percent.

- a. 0.15
- b. 0.08
- c. 0.1475
- d. 0.155



Now go to the **Review** solutions in the **Appendix**.

Topic 1 Savings Accounts



Introduction

Most people open savings accounts to have money on hand to pay future bills or to have resources available if unforeseen emergencies arise. Savings accounts are the most common form of putting money away for some future use.



What Lies Ahead

Throughout the topic you will learn how to

1. state the reasons for saving money, and apply key words in banking to identify and compare the types of savings accounts
2. complete deposit and withdrawal slips
3. examine service charges associated with savings accounts
4. balance a savings account

Now that you know what to expect, turn the page to begin your study of savings accounts.



Exploring Topic 1

Activity 1



State the reasons for saving money, and apply key words in banking to identify and compare the types of savings accounts.

Reasons for Saving Money

Saving part of the money you get is a smart thing to do. Once you get in the habit of doing so, you will find it is not as hard to save as you thought. A small amount saved each week can add up to a lot of money. Then you will be able to buy what was only a dream before. Furthermore, savings can provide security for the unexpected. When you put your money in a bank account, it grows. The bank pays you interest while they keep it for you.

Types of Savings Accounts

There are different types of savings accounts. This depends on how the interest is paid. It is important to pick the type of savings account that is best for you.

Basic Savings - Monthly

- Interest is calculated on the lowest balance in your account each month and paid to your account twice a year.
- Most banks will not allow you to write cheques on this account. If you want to take money out, you have to go to the bank yourself.

Daily Interest Savings

- Interest is calculated on the balance in your account at the end of each day and paid to your account each month.
- The interest on this account is a little lower than the interest on a basic savings account.
- There may be rules that affect these accounts. For example, there may be a minimum balance or a restriction on the number of withdrawals in a month.
- Most banks will not allow you to write cheques on this account.

Before we continue with savings accounts, you should become familiar with some of the key words in banking. To follow is a list of the most frequently-used words in banking.

Be aware of this fact and try to maintain a fairly constant balance. If you have to take money out of your monthly savings account, do so at the beginning of the month rather than at the end of the month.

Key Words in Banking

- **withdrawal** - taking money out of your account
- **deposit** - putting money into your account
- **interest** - money the bank pays you for putting money in the bank
- **transfer** - moving money from one account to another
- **service charge** - money you pay to the bank for handling your account

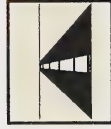
Do the questions which follow.

1. Give two reasons why you should save money.
2. What is the difference between a basic savings account and a daily interest savings account?
3. What is the difference between a deposit and a withdrawal?
4. What is the difference between interest and a service charge?



For solutions to Activity 1, turn to the **Appendix, Topic 1.**

Activity 2



Complete deposit and withdrawal slips.

The following information will show you how to fill out two important bank forms. Always make sure you write in ink because pencil can be easily changed.

There are two forms you will need to use.

- withdrawal slips - for taking money out of your account
- deposit slips - for putting money into your account

Withdrawal Slips

Sample Slip

SAVINGS ACCOUNT CASH WITHDRAWAL RECEIPT		① <u>1991/17 19 88</u>
NOT NEGOTIABLE OUTSIDE THIS OFFICE		
RECEIVED	FROM	\$ <u>18.75</u>
THE BANK OF ALBERTA		
③ <u>EIGHTEEN</u>	<u>75</u>	<u>100</u> DOLLARS
⑤ <u>Linda Cox</u> (Please sign in presence of Teller)		
④ SAVINGS ACCOUNT NO.	123654	

The withdrawal slip is the form you use to take money out of your bank account when you go to the bank.

Step 1: Print the date.

Step 2: Write the amount you want to withdraw in numbers right next to the \$ sign.

Step 3: Write the dollar amount in words and the cents in numbers. Draw a line in the leftover space so that nothing else can be added.

Step 4: Write in your account number.

Step 5: Sign your withdrawal slip the way you signed the card when you opened your account.

Deposit Slips

Sample Slip

THE BANK OF ALBERTA ① <u>AUGUST 5</u> 19 <u>88</u> SAVINGS ACCOUNT DEPOSIT CREDIT		LIST CHEQUES AND/OR COUPONS ④	CURRENCY TOTAL OF CHEQUES OR COUPONS TOTAL LESS RECEIVED IN CASH (Please sign in presence of Teller) AMOUNT OF DEPOSIT	⑥ 175 50 558 90 734 40 100 00 ⑦ ⑧ ⑨ 634 40
② <u>LINDA COX</u> NAME ③ <u>Linda Cox</u> DEPOSITED BY		⑤ 558 90 FORWARD TOTAL		

SAVINGS ACCOUNT NO. 123654 ⑩

The deposit slip is the form you use to put money into your account. Follow these steps to fill out your deposit slip.

Step 1: Print the date.

Step 2: Print the name of the account owner.

Step 3: Sign your name.

Step 4: If you are depositing a cheque you received from someone else, fill in the amount here. Sign your name on the back of the cheque when you arrive at the bank. This is called **endorsing** the cheque. Do not endorse your cheque before you get to the bank. Once it is endorsed, anyone can cash your cheque.

Step 5: Find the sum of the cheques.

Step 6: Enter the currency (cash) deposited.

Step 7: Add the amount of cash and the amount of the cheques you deposited.

Step 8: If you want some of the money back, fill in the amount and sign your name.

Step 9: Subtract step 8 from step 7 to get the amount you want to put into your account.

Step 10: Fill in your account number.

Passbooks and Statements

When you first open a savings account, your bank will provide you with a savings account passbook. When you make a deposit or withdrawal, a bank teller records in your passbook the transaction that took place. It is a good idea to balance your account so that you know exactly how much money you have in it.

Try the following questions.

1. What is a deposit slip?
2. What is a withdrawal slip?
3. What does it mean to endorse a cheque?

NOTE: Most banks have computers that will automatically balance your passbook when a transaction has occurred.

4. Sue Jones fills out the savings deposit form shown. What is her total deposit?

DEPOSITED TO ACCOUNT OF		DOLLARS CENTS	
CHEQUES			
1.	12	90	95
2.	64	00	
3.	62	25	
TOTAL			

Sue Jones
Name of Account

Address 93 - 54th AVE
TORONTO, ONTARIO

Date OCT 25 19 88

ACS SAVINGS

5. On September 20, 1989, Maury Tymchuk completed a savings account deposit slip on which he recorded two cheques for \$75.85 and \$95.20 for deposit. He received \$50.00 in cash. Complete the deposit slip below to find his total deposit.

THE BANK OF ALBERTA		CASH	
DATE	ACCOUNT NUMBER <u>466-88-99</u>		
CREDIT ACCOUNT OF			
INITIALS DEPOSITOR	TELLER		
CASH RECEIVED - SIGNATURE			
SUB-TOTAL			
LESS CASH			
NET DEPOSIT			

6. Write each amount in words as it would appear on a savings account withdrawal slip.

- a. \$30.75 b. \$107.00
c. \$5875.50

7. On August 14, 1989, John Clark fills out a savings withdrawal slip for \$217.50 to purchase a gift. Show his withdrawal slip. John's savings account number is 1-254376.

SAVINGS WITHDRAWAL	_____ 19 _____
RECEIVED	
FROM THE BANK OF ALBERTA	\$ _____
	_____ DOLLARS
	_____ 100
ACCOUNT NUMBER _____	(Please sign in presence of Teller)



For solutions to Activity 2, turn to the Appendix, Topic 1.

Activity 3



Examine service charges associated with savings accounts.

Service Charges

Examine the various service charges that are associated with a savings account.

Some banks will allow you to write a cheque on your savings account, but they have a \$2.00 per cheque service charge for this service. If you transfer money from your savings account into a different account, most banks will charge you a \$1.25 per transfer service charge. Usually, you are allowed two free transfers per month. Transfer service charges are added after the two free transfers.

Example 1

George Mudryk has a savings account. Last month, George wrote 5 cheques on this account. He also transferred different sums of money from this account to his chequing account 7 times. What were George's service charges for the month?

Solution:

$$\begin{array}{rcl} 5 \text{ cheques at } \$2.00 \text{ per cheque} & & = \$10.00 \\ \text{plus } 7 - 2 = 5 \text{ transfers at } \$1.25/\text{transfer} & = & \underline{\$6.25} \\ & & \$16.25 \end{array}$$

George's total service charge would be \$16.25.

Do the questions that follow.

1. What is a service charge?
2. Calculate the service charge if Joe Brown wrote 3 cheques and had 3 transfers from his savings account in one month? Use the schedule of fees which follows:

- \$2.00 per cheque
- \$1.25 per transfer after two free transfers



For solutions to Activity 3, turn to the **Appendix, Topic 1.**

Activity 4



Balance a savings account.

Balancing a Savings Account

You should balance your savings account on a regular basis. Most people balance their savings account on a monthly basis.



New Balance = previous balance + interest + deposits – withdrawals

Example 2

Mamie Lee Kiel's savings account passbook is shown below. What is her balance as of July 11, 1988?

Withdrawals by cash only on this account			
DATE	ITEM	WITHDRAWAL	BALANCE
SEP 28-87	DEP		***881.81
OCT 29-87	DEP		***61.60
OCT 30-87	ICR		***19.77
NOV 09-87	WD	***800.00	
FEB 24-88	DEP		***62.00
MAR 18-88	DEP		***62.00
APR 20-88	DEP		****4.61
APR 29-88	ICR		****62.00
JUL 11-88	DEP		

Hint: Note the following abbreviations:

DEP - Deposit
ICR - Interest Credit
WD - Withdrawal

Solution:

New balance = previous balance + interest + deposits – withdrawals
 $= \$943.41 + (\$19.77 + \$4.61) + (4 \times \$62.00) - \$800.00$
 $= \$943.41 + \$24.38 + \$248.00 - \800.00
 $= \$415.79$

Mamie has \$415.79 in her account.

Now do the following questions.

1. Complete the chart below.

Previous balance	\$371.21	\$652.15	\$795.30
Interest	\$ 9.29	\$ 26.58	\$ 20.70
Deposit	\$ 59.65	-	-
Withdrawal	-	\$125.00	-
New balance	a.	b.	c.

2. On January 16, Ken Boyd deposited \$85.75 in his savings account. The teller also credited \$8.80 in interest to his account. What is the new balance in his account?

DEPOSITOR: Ken Boyd				
DATE	WITHDRAWAL	DEPOSIT	INTEREST	BALANCE
1/01				\$500.00
1/05		\$135.15		\$635.15
1/16		\$ 85.75	\$8.80	
1/16				

3. Eleanor Schade's savings account statement is shown below. What is the balance in her account on December 23, 1988?

Withdrawals by cash only on this account			
DATE	ITEM	WITHDRAWAL	BALANCE
MAR 20-88	DEP		****54.50
APR 30-88	INT		*****80.08
JUN 21-88	DEP		****54.88
JUN 21-88	DM	**2575.00	
OCT 31-88	INT		****13.86
NOV 01-88	DEP		****54.50
DEC 23-88	DEP		****54.50



For solutions to Activity 4, turn to the Appendix, Topic 1.

If you require help, do the Extra Help section.

If you want more challenging explorations, do the Extensions section.

} You may decide to do both.



Extra Help

Most banks provide at least the following services.

1. They provide loans for personal needs.
2. They provide mortgages.
3. They make savings accounts possible.
4. They make chequing accounts possible.
5. They sell bonds.
6. They accept payment of utility bills.
7. They provide credit card services.

To understand banking even more, try the following questions.

Suppose that George William maintains a savings account at the Bank of Kings. Using the sample forms provided, fill in the following information:

1. On November 18, 1989, George made a deposit. He deposited 2 ten-dollar bills, 3 five-dollar bills, and 7 one-dollar bills. In addition, he included a \$25 cheque and a \$6.73 cheque. Use the deposit slip to fill in this information for George.

- In the blank labelled (A), fill in George's account number which is "12345."
- In the blank labelled (B), fill in the date of the deposit.
- In the two blanks labelled (C), print in George's full name.
- In the three blanks labelled (D), place the number of bills of each denomination of currency (paper money).
- In the three blanks labelled (E), fill in the value of each denomination of currency.
- In the blank labelled (F), enter the sum of all cash deposited.
- In the space labelled (G), put in the amounts of the cheques deposited. (The cents go to the right of the vertical line. Dollars go the the left of it.)
- In the blank labelled (H), place the total of all cheques being deposited.
- In the blank labelled (I), enter the sum of the amounts from blanks (F) and (H).

The First Bank
Bank of Kings

Savings Account

Account No. (A)

Date (B)

Credit (C)

Deposited by (C)

Cheques	Cash	Dollars	Cents
(G) 25 00	(D) x 1		(E)
	x 2		
	(D) x 5		(E)
	2 (D) x 10	\$20 00	(E)
	x 20		
	x		
	x		
	x		
	Coin		
Coupons Total/Cash & Coupons			(F)
			(H)

Sub-total
Less cash received
deducted from this deposit

Customer's Signature
Please sign in presence of Teller

Teller's Initials (I)
Net Deposit

2. On December 12, 1989, George withdraws \$25 from his savings account. In filling out the withdrawal slip, George must enter the date in blank (S), the amount withdrawn (in decimal form) in blank (T), the number of dollars (in words) in blank (U), and the number of cents (in numerals) in blank (V). The account number must appear in blank (W), while George's signature must be in blank (X). (Note: The signature must be written – not printed.)

Fill in blanks (S) - (W) for George, using the following form.

<p>The First Bank Bank of Kings</p>	<p>Savings Department</p>
<p>Received from the Bank of Kings</p>	<p>(S) _____ 19 _____</p>
<p>(U) _____</p>	<p>(T) \$ _____</p>
<p>Draw in a wavy line to fill out any excess space</p>	
<p>Charge to Account No. _____</p>	<p>(W) <i>George William</i> _____</p>
<p>(V) _____ Dollars</p>	
<p><small>The Pass Book must be presented with this receipt</small></p>	

3. In the passbook provided, enter the amount of George's deposit on November 18 in blank (M). Figure out the resulting balance, and put this amount in blank (N). Then, enter the amount of George's withdrawal on December 12 in blank (P). Figure out the new balance, and put this amount in blank (Q).

(Note: According to banking procedures, the passbook is filled in by the bank teller. The initials signed are those of the teller.)

True Savings Account				The First Bank Bank of Kings			
Account Number		Main		Branch		Telephone Number	
12345		897-0000					
Date/1983	Particulars	Withdrawal	Deposit	Balance		Initials	
Aug 15	fwd.			\$375	68		
Aug 15			\$62	45	13	9P	
Oct 31	int.		\$ 9	28	41		
Nov 18			(M)		(N)	r	
Dec 12		(P)			(Q)	u	



For solutions to Extra Help, turn to the Appendix, Topic 1.



Extensions

The bank usually makes a charge against the account for each cheque cleared. Today, charges per cheque can range from \$0.25 to \$0.50. A sample cheque drawn on the account of Harold Finance is shown below.

① H.I. Finance 23 Skidoo Place Anywhere, Alberta		②
③ The Happy Bank 123 Happy Drive Anywhere, Alberta		Cheque Number 324
Pay to the Order of	④ March 4 19 83	
⑤ Food Market	\$ ⑥ 56.23	
⑦ Fifty-six	⑧ 23 Dollars	
⑨ H.I. Finance		
⑩ 123 11 45678 111 901 23 111 45678 11 4		

Note the following information that is printed on the cheque.

- ① This is the name and address of the individual or business that has the account. (Today, most cheques are personalized in this manner.)
- ② This is the number of this individual cheque.
- ③ This is the name and address of the bank handling the account.
- ④ This is the magnetic ink coding for that particular bank, branch, and account number.

The person writing the cheque must fill in the following information

- Ⓐ The date on which the cheque is written must be recorded.
- Ⓑ This is the name of the individual or business to whom the cheque is issued. (This person or business is called the payee.)
- Ⓒ This is the amount of the cheque written as a decimal number.
- Ⓓ This is the number of dollars written in words and the number of cents written as numerals over 100. (Note: If there are no cents, you can write $\frac{00}{100}$.) A wavy line is used to fill any space between the number of dollars and cents.
- Ⓔ This is the signature of the person issuing the cheque.

In order to ensure that unauthorized persons cannot write cheques on an account, the bank keeps a card on file with the signatures that can appear in blank Ⓔ on the cheque.

Write the following cheques for Harold Finance. (Use the blank cheques provided. Ink should be used for all cheque-writing.)

	<u>Cheque #</u>	<u>Date</u>	<u>Payee</u>	<u>Amount</u>
1.	325	March 12, 1983	Paul's Shoes	\$ 24.95
2.	326	March 25, 1983	Food Market	\$126.89
3.	327	April 1, 1983	Ace Finance Company	\$325.00
4.	328	April 6, 1983	Charge-it Card	\$142.29
5.	329	April 8, 1983	Electric Power Co.	\$ 25.38

1.

H.I. Finance 23 Skidoo Place Anywhere, Alberta		19	Cheque Number 325
Pay to the Order of		\$	
The Happy Bank 123 Happy Drive Anywhere, Alberta			Dollars 100
		H. I. Finance	
123 ■ ■ 45678 901 ■ ■ 23 45678 ■			

CANCELLED

2.

H.I. Finance 23 Skidoo Place Anywhere, Alberta		19	Cheque Number 326
Pay to the Order of		\$	
The Happy Bank 123 Happy Drive Anywhere, Alberta			Dollars 100
		H. I. Finance	
123 ■ ■ 45678 901 ■ ■ 23 45678 ■			

CANCELLED

3.

H.I. Finance 23 Skidoo Place Anywhere, Alberta	19	Cheque Number 327
CANCELLED		
Pay to the Order of	\$	
The Happy Bank 123 Happy Drive Anywhere, Alberta		100 Dollars
	H. I. Finance	
123 ■ ■ 45678 ■ 901 ■ ■ 23 ■ 45678 ■		

4.

H.I. Finance 23 Skidoo Place Anywhere, Alberta	19	Cheque Number 328
CANCELLED		
Pay to the Order of	\$	
The Happy Bank 123 Happy Drive Anywhere, Alberta		100 Dollars
	H. I. Finance	
123 ■ ■ 45678 ■ 901 ■ ■ 23 ■ 45678 ■		

5.

H.I. Finance 23 Skidoo Place Anywhere, Alberta		19	Cheque Number 329
Pay to the Order of		\$	
The Happy Bank 123 Happy Drive Anywhere, Alberta		100	Dollars
		<i>H. I. Finance</i>	
123 ■ ■ 45678 ■ 901 ■ ■ 23 ■ 45678 ■			

CANCELLED

6. a. Use the worksheets for April 1989 and May 1989 to record the transactions for these two months. After doing the worksheets, answer the questions that follow.

April 1989			
Detailed List of Transactions			
Mr. Winter's paycheck	\$1460.00	car payment	\$273.50
Mrs. Winter's paycheck	\$ 485.00	allowances	\$ 25.00
allowances	\$ 25.00	soap/paper goods	\$ 8.73
rent	\$ 495.00	toiletries	\$ 10.79
groceries	\$ 53.78	power/water	\$ 53.95
bus pass	\$ 31.00	groceries	\$ 84.13
summer clothing/yardage	\$ 142.16	final loan payment	\$ 50.73
gasoline	\$ 22.11	donation	\$ 10.00
telephone	\$ 9.25	gasoline	\$ 19.73
natural gas	\$ 44.17	baby-sitter	\$ 8.00
baby-sitter	\$ 6.00	books	\$ 14.20
groceries	\$ 74.12	groceries	\$ 98.50
allowances	\$ 25.00	allowances	\$ 25.00

May 1989			
Detailed List of Transactions			
Mr. Winter's paycheck	\$1460.00	groceries	\$ 71.16
Mrs. Winter's paycheck	\$ 453.00	dental work	\$ 85.00
allowances	\$ 25.00	gasoline	\$ 19.40
rent	\$ 495.00	baby-sitter	\$ 5.00
car insurance	\$ 128.00	theatre tickets	\$ 18.00
Mother's Day gift	\$ 28.75	allowances	\$ 25.00
bus pass	\$ 31.00	car payment	\$273.50
gasoline	\$ 23.65	donation	\$ 10.00
groceries	\$ 68.12	power/water	\$ 55.68
telephone	\$ 9.25	department store service charge	\$ 1.50
natural gas	\$ 43.97	groceries	\$ 96.72
eye examinations	\$ 30.00	garden/flower seeds	\$ 8.00
pair of glasses	\$ 102.00	hardware rebate (bonus)	\$ 15.00
allowances	\$ 25.00	allowances	\$ 25.00
		dry cleaning	\$ 34.60

April 1989

Worksheet

Paycheque	Other Income	Loan Payment	Food	Housing and Utilities	Medical	Personal	Insurance
Allowances	Household	Transportation	Entertainment	Clothing	Gifts and Donations	Service Charges	Miscellaneous

Paycheque	Other Income	Loan Payment	Food	Housing and Utilities	Medical	Personal	Insurance
Allowances	Household	Transportation	Entertainment	Clothing	Gifts and Donations	Service Charges	Miscellaneous

- b. Find the total differences for April and May on the worksheets.
- c. Use the differences to find out how much the Winters saved or overspent during the 2-month period.

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$$



For solutions to **Extensions**, turn to the **Appendix, Topic 1**.

Topic 2 Interest



Introduction

In the last topic, bank interest was mentioned in your study of savings accounts. In this topic, you will see how this interest is calculated for the various types of savings accounts.



What Lies Ahead

Throughout the topic you will learn how to

1. change days and months into fractions of years
2. calculate simple interest
3. calculate compound interest through repeated simple interest
4. calculate compound interest by using tables or a computer

Now that you know what to expect, turn the page to begin your study of interest.



Exploring Topic 2

You may study this topic by listening to the audio tape or by studying the print, or you may do both. Whichever way you choose to study this topic, answer the questions which follow each of the activities in the print section.

Audio Activity - Interest

Activity 1



Change days and months into fractions of years.

Activity 2



Calculate simple interest.

Activity 3



Calculate compound interest through repeated simple interest.

Activity 4



Calculate compound interest by using tables or a computer.



Insert the tape titled *Mathematics 24 - Interest* into your tape recorder, and follow the instructions on the tape.

1

Interest - money paid for the use of money

2

Simple interest - based on original principal each period

Compound interest - based on original principal plus interest from all previous periods

3

$I = Prt$ where I is interest,

P is principal,

r is rate of interest, and

t is time in years.

4

Deposit \$3000.00 at 7% simple interest per annum.
How much interest is earned in 11 months?

5

Solution:

$$I = Prt$$

$$P = \$3000.00$$

$$r = 7\% \text{ per annum} = 0.07$$

$$t = 11 \text{ months} = \frac{11}{12} \text{ year}$$

$$I = \$3000.00 \times 0.07 \times \frac{11}{12}$$

=

=

=

7

Deposit \$3000.00 at 7% simple interest per annum.
How much interest is earned in 250 days?

Solution:

$$I = Prt$$

$$P = \$3000.00$$

$$r = 7\% \text{ per annum} = 0.07$$

$$t = 150 \text{ days} = \frac{250}{365} \text{ year}$$

$$I = \$3000.00 \times 0.07 \times \frac{250}{365}$$

$$= \$210.00 \times \frac{250}{365}$$

$$= \frac{\$52\,500}{365}$$

$$= \$143.84$$

6

$$I = \$3000.00 \times 0.07 \times \frac{11}{12}$$

$$= \$3000.00 \times 0.07 \times 0.92 \left(\text{where } \frac{11}{12} = 0.91\bar{6} = 0.92 \right)$$

$$= \$193.20$$

8

Compounding Period	# of Times Interest Paid Per Year
annually	1
semiannually	2
quarterly	4
monthly	12
weekly	52
daily	365

\$2000.00 is deposited at 10% per annum, compounded quarterly. How much money is in the account after one year?

Simple interest formula: $I = Prt$

1st period

$$I = Prt$$

$$I = \$2000.00 \times 0.10 \times \frac{1}{4}$$

$$= \$200.00 \times \frac{1}{4}$$

$$= \$50.00$$

$$\text{New principal} = \$2000.00 + \$50.00$$

$$= \$2050.00$$

2nd period

$$I = \$2050.00 \times 0.10 \times \frac{1}{4}$$

$$= \$205.00 \times \frac{1}{4}$$

$$= \$51.25$$

$$\text{New principal} = \$2050.00 + \$51.25$$

$$= \$2101.25$$

3rd period

$$I = \$2101.25 \times 0.10 \times \frac{1}{4}$$

$$= \$210.125 \times \frac{1}{4}$$

$$= \$52.53$$

$$\text{New principal} = \$2101.25 + \$52.53$$

$$= \$2153.78$$

4th period

$$I = \$2153.78 \times 0.10 \times \frac{1}{4}$$

$$= \$215.378 \times \frac{1}{4}$$

$$= \$53.84$$

11

Total interest

$$= \$50.00 + \$51.25 + \$52.53 + \$53.84$$

$$= \$207.62$$

Total amount of money

$$= \$2000.00 + \$207.62$$

$$= \$2207.62$$

13

\$2500 is deposited in a savings account that pays 10% interest compounded quarterly. How much money will be in the account after 5 years? How much interest is earned in 5 years?

Solution:

- Step 1: $10\% \div 4 = 2.5\%$ per compounding period
 Step 2: $5 \times 4 = 20$ compounding periods
 Step 3: From the table, the amount per dollar is 1.6386.
 Step 4: $\$2500 \times 1.6386 = \4096.50
 Step 5: $\$4096.50 - \$2500.00 = \$1596.50$

14

- Step 1: $10\% \div 4 = 2.5\%$ per compounding period
 Step 2: $1 \times 4 = 4$ compounding periods
 Step 3: From the table, the amount per dollar is 1.1038.
 Step 4: $\$2000 \times 1.1038 = \2207.60

12 Compound Interest Tables

No. of Periods	Compound Interest Table for One Dollar									
	1.5%	2%	2.5%	3%	3.5%	4%	5%	6%	7%	8%
1	1.0150	1.0200	1.0250	1.0300	1.0350	1.0400	1.0500	1.0600	1.0700	1.0800
2	1.0302	1.0404	1.0506	1.0609	1.0712	1.0816	1.1025	1.1236	1.1449	1.1664
3	1.0457	1.0612	1.0769	1.0927	1.1087	1.1248	1.1576	1.1910	1.2250	1.2597
4	1.0614	1.0824	1.1038	1.1255	1.1475	1.1699	1.2155	1.2625	1.3108	1.3605
5	1.0773	1.1041	1.1314	1.1593	1.1877	1.2167	1.2763	1.3382	1.4026	1.4693
6	1.0934	1.1262	1.1597	1.1941	1.2293	1.2653	1.3401	1.4186	1.5007	1.5869
7	1.1098	1.1487	1.1887	1.2299	1.2723	1.3159	1.4071	1.5036	1.6058	1.7138
8	1.1265	1.1717	1.2184	1.2668	1.3168	1.3686	1.4775	1.5938	1.7182	1.8059
9	1.1434	1.1951	1.2489	1.3048	1.3629	1.4233	1.5513	1.6895	1.8385	1.9990
10	1.1605	1.2190	1.2801	1.3439	1.4106	1.4802	1.6289	1.7908	1.9672	2.1589
11	1.1779	1.2434	1.3121	1.3842	1.4600	1.5395	1.7103	1.8983	2.1049	2.3316
12	1.1956	1.2682	1.3449	1.4258	1.5111	1.6010	1.7959	2.0122	2.2522	2.5182
13	1.2136	1.2936	1.3785	1.4685	1.5640	1.6651	1.8856	2.1329	2.4098	2.7196
14	1.2318	1.3195	1.4130	1.5126	1.6187	1.7317	1.9799	2.2609	2.5785	2.9372
15	1.2502	1.3459	1.4483	1.5580	1.6753	1.8009	2.0789	2.3966	2.7590	3.1722
16	1.2690	1.3728	1.4845	1.6047	1.7340	1.8730	2.1829	2.5404	2.9522	3.4259
17	1.2880	1.4002	1.5216	1.6528	1.7947	1.9479	2.2920	2.6928	3.1588	3.7000
18	1.3073	1.4282	1.5597	1.7024	1.8575	2.0258	2.4066	2.8543	3.3799	3.9960
19	1.3270	1.4568	1.5987	1.7535	1.9225	2.1068	2.5270	3.0256	3.6165	4.3157
20	1.3469	1.4859	1.6386	1.8061	1.9898	2.1911	2.6533	3.2071	3.8697	4.6610
21	1.3671	1.5157	1.6796	1.8603	2.0594	2.2788	2.7860	3.3996	4.1406	5.0338
22	1.3876	1.5460	1.7216	1.9161	2.1315	2.3699	2.9253	3.6035	4.4304	5.4365
23	1.4084	1.5769	1.7646	1.9736	2.2061	2.4647	3.0715	3.8198	4.7405	5.8715
24	1.4295	1.6084	1.8087	2.0328	2.2833	2.5633	3.2251	4.0489	5.0724	6.3412
25	1.4509	1.6407	1.8539	2.0938	2.3673	2.6658	3.3864	4.2919	5.4274	6.8485



Activity 1



Change days and months into fractions of years.

Banks normally calculate interest in terms of a year. It becomes necessary to change months or days into parts of a year so that you will be able to use interest formulas that are based on a year.

Follow the next two examples that show you how to change months and days into a part of a year.

Example 1

Six months is what part of a year?

Solution:

To change months into a part of a year, write as a fraction with 12 as the denominator. Express answers in lowest terms.

$$6 \text{ months} = \frac{6}{12} = \frac{1}{2} \text{ year}$$

Six months is $\frac{1}{2}$ of a year.

Example 2

Two hundred forty days is what part of a year?

Solution:

To change days into a part of a year, write as a fraction with 365 as the denominator. Express answers in lowest terms.

$$240 \text{ days} = \frac{240}{365} \text{ year} = \frac{48}{73} \text{ year}$$

Two hundred forty days is $\frac{48}{73}$ of a year.

Now that you know how to change months and days into a part of a year, answer the following question.

1. Change the times below to part of a year. Express each fraction in simplest form.

- | | |
|--------------|-------------|
| a. 8 months | b. 2 months |
| c. 42 months | d. 30 days |
| e. 120 days | f. 300 days |



For solutions to Activity 1, turn to the **Appendix, Topic 2**.

There are 365 days in a year.

There are 12 months in a year.

Activity 2



Calculate simple interest.

When you deposit money in a savings account, you are letting the bank use your money. The amount you earn for letting the bank use your money is called **interest**. The **principal** is the amount of money earning interest. The **annual interest rate** is the percent of the principal that you earn as interest per year. **Simple interest** is interest earned on the original principal only.



Interest =
principal \times rate \times time

This relation can be expressed by the following formula.



$$I = Prt$$

I = interest
 P = principal
 r = rate (interest rate)
 t = time

Example 3

Dale Weimer deposited \$2000.00 in a savings account that pays interest at a rate of 8% per annum. Calculate the amount of simple interest that he earned after 7 months.

Solution:

Use $I = Prt$.

$$I = ?$$

$$P = \$2000.00$$

$$r = 8\% \text{ or } r = 0.08 \text{ or } \frac{8}{100}$$

$$t = \frac{7}{12}$$

$$I = \$2000 \times \frac{8}{100} \times \frac{7}{12} = \$93.3\bar{3}$$



Use your calculator to work this out. Round your answer to the nearest cent.

$$I = \$93.33$$

The interest earned is \$93.33.

$$r = 8\% = \frac{8}{100} = 0.08$$

The interest rate is usually quoted per annum (per year).

Time is usually expressed in terms of years (unless otherwise stated).

Example 4

Calculate the simple interest if \$1250.00 was invested for 235 days at an annual interest rate of $12\frac{1}{2}\%$.

Solution:

$$\text{Use } I = Prt.$$

$$I = ?$$

$$P = \$1250.00$$

$$r = 12\frac{1}{2}\%$$

$$t = \frac{235}{365}$$

$$I = \$1250 \times \frac{12.5}{100} \times \frac{235}{365} = \$100.599 \text{ 31}$$

$$I = \$100.60$$



Use your calculator to work this out. Round your answer to the nearest cent.

$$I = \$100.60$$

The interest earned is \$100.60.

Now try the following questions.

- Find the simple interest for each situation below. Express your answer to the nearest cent.
 - $P = \$2200$ $r = 8\frac{3}{4}\%$ $t = 7$ years
 - $P = \$5000$ $r = 14\%$ $t = 16$ months
 - $P = \$750$ $r = 12.5\%$ $t = 36$ days
- The simple interest earned on a certain principal over 3 years at 7% per annum was \$5023. How large was the principal (to the nearest cent)?
- The simple interest earned on a principal of \$3000 over 7 years was \$1533. What was the rate of interest (to the nearest tenth)?
- The simple interest on a principal of \$575 at 10% was \$517.50. What was the time involved?



For solutions to Activity 2, turn to the **Appendix, Topic 2**.

Recall that principal is the original amount that is earning interest. In this case, the principal is \$1250.00.

$$r = 12\frac{1}{2}\% = \frac{12\frac{1}{2}}{100} = \frac{12.5}{100}$$

Activity 3



Calculate compound interest through repeated simple interest.

If you examine your savings account, you will find that the interest you earn during an interest period is added to your account. This new balance is then used to calculate the interest for the next interest period. This is what compound interest is.

Compound interest is earned not only on the original amount, but also on the interest earned during previous interest periods. Compound interest can work to your advantage or your disadvantage.

You will see that your money will grow faster if you receive compound interest rather than simple interest. By the same token, if you are paying back a bank loan, it will cost you more if the interest is compounded.

Before you begin to calculate compound interest, you must understand the meaning of certain phrases used. For example, what does it mean when you hear that interest is compounded quarterly or semiannually?

The following chart defines the number of times per year money is compounded, given the compounding period.

Compounding Period	# of Times Interest Paid Per Year
annually	1
semiannually	2
quarterly	4
monthly	12
weekly	52
daily	365

You can see from this chart that if interest is compounded quarterly, then interest will be paid 4 times per year, or interest is paid every 3 months.

$$\frac{3}{12} \text{ year} = \frac{1}{4} \text{ year}$$

Look at the next two examples. They show how compound interest can be calculated by using simple interest.

Example 5

Ron deposits \$5000.00 in a savings account that pays 8% interest compounded annually.

- How much interest will Ron earn in three years?

Solution:

Interest compounded annually is calculated once each year. Find the interest at the end of each year by using the simple interest formula.

End of the first year

$$I = Prt \quad I = ? \quad P = \$5000 \quad r = 8\% \quad t = 1 \text{ year}$$

$$I = \$5000 \times \frac{8}{100} \times 1 = \$400$$

The interest earned after the first year is \$400.

End of the second year

$$I = Prt \quad I = ? \quad P = (\$5000 + \$400) \quad r = 8\% \quad t = 1$$

$$= \$5400$$

$$I = \$5400 \times \frac{8}{100} \times 1 = \$432$$

Interest earned after the second year is \$432.00.

Hint: The principal in the second year is equal to the original principal (\$5000) plus the interest earned in the first year (\$400).

End of the third year

$$I = Prt \quad I = ? \quad P = (\$5400 + \$432) \quad r = 8\% \quad t = 1 \text{ year}$$

$$= \$5832$$

$$I = \$5832 \times \frac{8}{100} \times 1 = \$466.56$$

The interest earned after the third year is \$466.56.

The total interest that Ron would earn in three years is \$400 + \$432 + \$466.56 = \$1298.56.

- How much money will Ron have in his account after three years?

Solution:

$$\$5000 + \$1298.56 = \$6298.56$$

After three years, Ron will have \$6298.56 in his account.

Example 6

Heidi Ross deposited \$3000.00 in a savings account that pays 8% per annum compounded quarterly.

Hint: Per annum menas per year.

- How much interest will she earn in one year?

Note: Interest is compounded quarterly (4 times per year). This means that interest is calculated every 3 months or $\frac{1}{4}$ year.

Solution:

Calculate the simple interest for each quarter by using $I = Prt$.

Quarter	Principal Plus Previous Interest	Simple Interest Per Quarter (Use $I = Prt$)
1st	\$3000	$I = \$3000 \times \frac{8}{100} \times \frac{3}{12}$ $= \$60$
2nd	$\$3000 + \$60 = \$3060$	$I = \$3060 \times \frac{8}{100} \times \frac{3}{12}$ $= \$61.20$
3rd	$\$3060 + \$61.20 = \$3121.20$	$I = \$3121.20 \times \frac{8}{100} \times \frac{3}{12}$ $= \$62.42$
4th	$\$3121.20 + \$62.42 = \$3183.62$	$I = \$3183.62 \times \frac{8}{100} \times \frac{3}{12}$ $= \$63.67$

After 1 year, Heidi would have earned
 $\$60.00 + \$61.20 + \$62.42 + \$63.67 = \$247.29$ in interest.

- How much money will she have in her account after one year?

Solution:

$$\$3000.00 + \$247.29 = \$3247.29$$

After one year, Heidi would have \$3247.29 in her account.

As you can see, calculating compound interest in this manner is very tedious and time consuming. Later, you will see that there are other ways of finding compound interest. However, before doing this, do the questions that follow.

1. Find the compound interest for each of the first two compounding periods by using the simple interest formula.

- a. $P = \$1900$ $r = 12\%$ compounded quarterly
- b. $P = \$750$ $r = 10\%$ compounded monthly
- c. $P = \$1800$ $r = 6\frac{1}{4}\%$ compounded semiannually

For question 1a, interest is compounded every 3 months; thus, $t = \frac{3}{12}$ year.

2. In question 1, what is the total interest earned in each case after the first two compounding periods?



For solutions to Activity 3, turn to the **Appendix, Topic 2**.

Activity 4



Calculate compound interest by using tables or a computer.

Compound Interest Tables

Compound Interest Table for One Dollar

No. of Periods	1.5%	2%	2.5%	3%	3.5%	4%	5%	6%	7%	8%
1	1.0150	1.0200	1.0250	1.0300	1.0350	1.0400	1.0500	1.0600	1.0700	1.0800
2	1.0302	1.0404	1.0506	1.0609	1.0712	1.0816	1.1025	1.1236	1.1449	1.1664
3	1.0457	1.0612	1.0769	1.0927	1.1087	1.1248	1.1576	1.1910	1.2250	1.2597
4	1.0614	1.0824	1.1038	1.1255	1.1475	1.1699	1.2155	1.2625	1.3108	1.3605
5	1.0773	1.1041	1.1314	1.1593	1.1877	1.2167	1.2763	1.3382	1.4026	1.4693
6	1.0934	1.1262	1.1597	1.1941	1.2293	1.2653	1.3401	1.4186	1.5007	1.5869
7	1.1098	1.1487	1.1887	1.2299	1.2723	1.3159	1.4071	1.5036	1.6058	1.7138
8	1.1265	1.1717	1.2184	1.2668	1.3168	1.3686	1.4775	1.5938	1.7182	1.8059
9	1.1434	1.1951	1.2489	1.3048	1.3629	1.4233	1.5513	1.6895	1.8385	1.9990
10	1.1605	1.2190	1.2801	1.3439	1.4106	1.4802	1.6289	1.7908	1.9672	2.1589
11	1.1779	1.2434	1.3121	1.3842	1.4600	1.5395	1.7103	1.8983	2.1049	2.3316
12	1.1956	1.2682	1.3449	1.4258	1.5111	1.6010	1.7959	2.0122	2.2522	2.5182
13	1.2136	1.2936	1.3785	1.4685	1.5640	1.6651	1.8856	2.1329	2.4098	2.7196
14	1.2318	1.3195	1.4130	1.5126	1.6187	1.7317	1.9799	2.2609	2.5785	2.9372
15	1.2502	1.3459	1.4483	1.5580	1.6753	1.8009	2.0789	2.3966	2.7590	3.1722
16	1.2690	1.3728	1.4845	1.6047	1.7340	1.8730	2.1829	2.5404	2.9522	3.4259
17	1.2880	1.4002	1.5216	1.6528	1.7947	1.9479	2.2920	2.6928	3.1588	3.7000
18	1.3073	1.4282	1.5597	1.7024	1.8575	2.0258	2.4066	2.8543	3.3799	3.9960
19	1.3270	1.4568	1.5987	1.7535	1.9225	2.1068	2.5270	3.0256	3.6165	4.3157
20	1.3469	1.4859	1.6386	1.8061	1.9898	2.1911	2.6533	3.2071	3.8697	4.6610
21	1.3671	1.5157	1.6796	1.8603	2.0594	2.2788	2.7860	3.3996	4.1406	5.0338
22	1.3876	1.5460	1.7216	1.9161	2.1315	2.3699	2.9253	3.6035	4.4304	5.4365
23	1.4084	1.5769	1.7646	1.9736	2.2061	2.4647	3.0715	3.8198	4.7405	5.8715
24	1.4295	1.6084	1.8087	2.0328	2.2833	2.5633	3.2251	4.0489	5.0724	6.3412
25	1.4509	1.6407	1.8539	2.0938	2.3673	2.6658	3.3864	4.2919	5.4274	6.8485

Compound interest tables are designed to allow people to compute compound interest without as much calculating.

This table is used to calculate the **amount** of money that **one dollar** would accrue if the interest were compounded. If you want to calculate the amount to which \$500 would accrue, you have to multiply by 500, the value to which one dollar would accrue.

To use the table, follow these steps.

Step 1: Find the interest rate per compounding period by dividing the annual interest rate by the number of times the interest is compounded each year. This step allows you to calculate the interest rate per compounding period. For example, if the interest rate is 12% per annum compounded semiannually, then the interest rate per compounding period is $\frac{12}{2} = 6\%$.

Step 2: Find the number of compounding periods by multiplying the number of years by the number of times the interest is compounded each year. This step calculates the number of compounding periods. For example, if your investment is compounded semiannually for 7 years, then the number of compounding periods would be $2 \times 7 = 14$.

Step 3: Read the entry from the table by using the row and column determined by steps 1 and 2. For example, if the number of compounding periods was 14 and the rate per period was 6%, then you would go from 14 across and from 6% down. The value you obtain is 2.2609.

Step 4: Multiply the entry you obtained from step 3 by the principal of the investment. The value that you obtained from the table (2.2609) is the amount to which one dollar would accrue. To find the value to which \$500 would accrue, multiply $2.2609 \times \$500 = \1130.45 .

Step 5: Subtract the original principal from the answer for step 4 to find the total amount of interest earned. For the example above, you subtract $\$1130.45 - \$500.00 = \$630.45$. The amount of interest that \$500 would earn if it were compounded 14 times at a rate of 6% per compounding period is \$630.45.

Accrue means to "build up."

Example 7

Dave Presley has \$1500 in a savings account that pays 8% interest compounded semiannually. How much interest will his account earn in 5 years?

Solution:

Step 1: $8\% \div 2 = 4\%$ per compounding period.

Step 2: $5 \times 2 = 10$ is the number of compounding periods.

Step 3: 1.4802 is obtained from the table.

Step 4: $\$1500 \times 1.4802 = \2220.30

Step 5: $\$2220.30 - \$1500.00 = \$720.30$

Dave's account would earn \$720.30 in interest in 5 years.

Example 8

Use the Compound Interest Tables. Don Ross deposited \$3000 in a savings account at 8% interest compounded quarterly. Compounded quarterly means 4 times per year. The interest rate per compounding period is $8\% \div 4 = 2\%$.

- How much interest does he earn in one year?

Solution:

Step 1: $8\% \div 4 = 2\%$

Step 2: $1 \times 4 = 4$ compounding periods

Step 3: 1.0824 from the table

Step 4: $\$3000 \times 1.0824 = \3247.20

Step 5: $\$3247.20 - \$3000 = \$247.20$

Don would earn \$247.20 in interest.

- How much money does his account have after one year?

Solution:

Don's account has \$3247.20.

Using the above information, do the following questions on your own.

1. Use the Compound Interest Tables provided earlier in this topic to find the interest earned by each account.

	Principal	Annual Interest Rate	Time (years)	Compounded
a.	\$200	5%	7	annually
b.	\$7000	7%	10	annually
c.	\$400	10%	2	semiannually
d.	\$575	8%	9	semiannually
e.	\$2000	8%	6	quarterly



For solutions to Activity 4, turn to the **Appendix, Topic 2.**

If you require help, do the Extra Help section.

If you want more challenging explorations, do the Extensions section.

You may decide to do both.



Extra Help

- **Time** is represented by the letter t . It is usually given in years or a fraction of a year. The time can also be in days, weeks, or months, particularly when the rate is per day, week, or month. When the rate is per annum, the time or t must be in years.

To calculate simple interest on any amount, at any annual rate, and for any time period, use the following formula.

$$I = Prt \quad (\text{Hint: In } I = Prt, \text{ the } Prt \text{ means } P \times r \times t.)$$

In this formula, the letters have special meaning.

- **Interest** is represented by the letter I which is always expressed in dollars and cents. This amount is always rounded to the nearest cent.
- **Principal** is represented by the letter P which is also given in dollars and cents. The principal is the amount on which interest is calculated and paid.
- **Rate of interest** is represented by the letter r . It is given as a percent. The rate is usually given as per year or per annum. On certain occasions, the rate may be per month. If no time element is mentioned, the rate is assumed to be per year. An

interest rate of $7\frac{1}{2}\%$ can be changed to $\frac{7\frac{1}{2}}{100}$ or $\frac{7.5}{100}$ or 0.075.

It is often necessary to find the amount after the simple interest has been calculated. The formula used to find the amount is

$$\begin{aligned} A &= P + I, \text{ where} & A &= \text{amount,} \\ & & P &= \text{principal, and} \\ & & I &= \text{interest.} \end{aligned}$$

Example 9



Find the simple interest and the amount for each of the following situations. Express the interest to the nearest cent. Use a calculator to find the answers.

Hint: Change the rate to decimal numerals first.

- \$5025 at $16\frac{1}{2}\%$ for $3\frac{1}{4}$ years

Solution:

$$I = Prt$$

$$I = \$5025 \times 0.165 \times 3.25$$

$$I = \$829.125 \times 3.25$$

$$I = \$2694.65625$$

$$I = \$2694.66$$

The interest is \$2694.66.

To find the amount, use the formula

$$A = P + I.$$

$$A = \$5025 + \$2694.66$$

$$A = \$7719.66$$

The amount is \$7719.66.

- \$1346.40 at a monthly rate of $1\frac{3}{8}\%$ for 16 months

Solution:

$$I = Prt$$

$$I = \$1346.40 \times 0.01375 \times 16$$

$$I = \$18.513 \times 16$$

$$I = \$296.208$$

$$I = \$296.21$$

The interest is \$296.21.

To find the amount, use the formula

$$A = P + I.$$

$$A = \$1346.40 + \$296.21$$

$$A = \$1642.61$$

The amount is \$1642.61.

- \$27 344 at a daily rate of $\frac{1}{2}\%$ for 267 days

Solution:

$$I = Prt$$

$$I = \$27\,344 \times 0.005 \times 267$$

$$I = \$136.72 \times 267$$

$$I = \$36\,504.24$$

The interest is \$36 504.24.

To find the amount, use the formula

$$A = P + I.$$

$$A = \$27\,344 + \$36\,504.24$$

$$A = \$63\,848.24$$

The amount is \$63 848.24

Now do the following problem on your own.

1. Find the simple interest and the amount for each of the following loans. Express the interest to the nearest cent.

a. \$12 300 at $12\frac{3}{4}\%$ for $4\frac{1}{4}$ years

b. \$293.65 at a monthly rate of $1\frac{3}{4}\%$ for 23 months

c. \$31 635 at a daily rate of $\frac{3}{16}\%$ for 157 days



For solutions to **Extra Help**, turn to the **Appendix**,
Topic 2.



Extensions

- Find r when $I = \$550$, $P = \$2600$, and $t = 1\frac{1}{2}$ years.
(correct to 1 decimal place)

Solution:

The simple interest formula can also be used to find each of the following:

- P when I , r , and t are given
- r when I , P , and t are given
- t when I , P , and r are given

Example 10

- Find P when $I = \$240$, $r = 5\%$, and $t = 2$ years.

Solution:

$$I = Prt$$

$$\$240 = P \times 0.05 \times 2$$

$$\$240 = 0.1P$$

$$P = \$240 \div 0.1$$

$$P = \$2400$$

The principal is \$2400.

The rate is approximately 14.1%.

- Find t when $I = \$1020$, $P = \$1450$, and $r = 6\frac{1}{2}\%$ per year.
(correct to 1 decimal place)

Solution:

$$I = Prt$$

$$\$1020 = \$1450 \times 0.065 \times t$$

$$\$1020 = \$94.25t$$

$$t = \$1020 \div \$94.25$$

$$t = 10.822$$

$$t = 10.8$$

The time is approximately 10.8 years.

You have seen that compound interest can be calculated using the simple interest formula the required number of times, or by using a compound interest table. There is a third method which can be used and which will be explained in greater detail later. This new way is by using the following formula.

$$A = P(1 + i)^n$$

In $A = P(1 + i)^n$,

A stands for amount,

P stands for principal,

i stands for interest rate, per period,

and

n stands for the number of interest periods.

Example 11

Find the amount of interest earned by a \$3000 investment at a rate of 12% if the interest is compounded quarterly for 1 year. Use all three methods to find the amount of interest. Round the answers to the nearest cent, and compare the results to see how close the amounts are to each other.

Solution:

Method 1: Simple Interest Calculated 4 Times.

$$1. \quad I = Prt$$

$$I = \$3000 \times \frac{12}{100} \times \frac{1}{4}$$

$$I = \$90.00$$

$$2. \quad I = Prt$$

$$I = \$3090.00 \times \frac{12}{100} \times \frac{1}{4}$$

$$I = \$30.9 \times 3$$

$$I = \$92.70$$

$$3. \quad I = Prt$$

$$I = \$3182.70 \times \frac{12}{100} \times \frac{1}{4}$$

$$I = \$31.827 \times 3$$

$$I = \$95.48$$

$$4. \quad I = Prt$$

$$I = \$3278.18 \times \frac{12}{100} \times \frac{1}{4}$$

$$I = \$32.7818 \times 3$$

$$I = \$98.35$$

The total interest earned is

$$\$90.00 + \$92.70 + \$95.48 + \$98.35 = \$376.53.$$

Method 2: Using the Compound Interest Table

Step 1: $12\% \div 4 = 3\%$ per compounding period

Step 2: $1 \times 4 = 4$ is the number of compounding periods

Step 3: 1.1255 from the table

$$\text{Step 4: } \$3000 \times 1.1255 = \$3376.50$$

$$\text{Step 5: } \$3376.50 - \$3000.00 = \$376.50$$

The interest earned would be \$376.50.

Method 3: Using the Compound Interest Formula

$$A = P(1+i)^n \quad P = \$3000$$

$$i = 3\%$$

$$n = 4$$

$$A = \$3000(1 + 0.03)^4$$

$$A = \$3000(1.03)^4 \quad \text{Use a calculator here.}$$

$$A = \$3000(1.12550881)$$

$$A = \$3376.52643$$

$$A = \$3376.53$$

$$i = A - P$$

$$i = \$3376.53 - \$3000.00 = \$376.53$$

The interest earned would be \$376.53.

Comparing the three methods, you can see that the interest earned is almost the same in each case.

$$\text{Method 1} = \$376.53$$

$$\text{Method 2} = \$376.50$$

$$\text{Method 3} = \$376.53$$

Do the following two questions.

Follow the same instructions as the ones used to solve Example 11. Compare the results as in Example 11.

1. Find the amount of interest for an investment of \$4500 at a rate of 14% for $1\frac{1}{2}$ years compounded semiannually.
2. Find the amount of interest for an investment of \$10 250 at a rate of 14% for $1\frac{1}{4}$ years compounded every 3 months.



For solutions to **Extensions**, turn to the **Appendix, Topic 2**.



Topic 3 Savings Through Other Investments



Introduction

Savings accounts are the most popular way of making money earn interest. In this topic, you will be introduced to other common and perhaps better ways of making money by using money. They are better because they usually result in greater returns for your investments.



What Lies Ahead

Throughout the topic you will learn how to

1. define, examine, and compare other savings investments such as term deposits, savings bonds, Treasury Bills (T-Bills), and Registered Retirement Savings Plans

Now that you know what to expect, turn the page to begin your study of savings through other investments.



Exploring Topic 3

Activity 1



Define, examine, and compare other savings investments such as term deposits, savings bonds, Treasury Bills (T-Bills), and Registered Retirement Savings Plans.

Most people spend a good portion of their lives working for money. By investing your money wisely, it is possible to have money working for you.

Before you can make the proper investment choices, it is important that you know and understand what your choices are. You will look at the more common savings investments, and this will show you some of the choices available.

Term Deposits

One way to invest your money is to invest in a term deposit. Term deposits earn interest at a higher rate than a savings account. Term deposits earn a guaranteed rate of interest. You may invest in a long term deposit for 1 to 5 years (minimum investment is \$1000), or you may invest in a short term deposit for 30 days to less than 1 year (minimum amount is usually \$5000). Most term deposits earn interest compounded annually. It should be noted that there is a penalty for early withdrawal from a term deposit.

To find the amount of money in a term deposit, use the following formula.



$$\text{Amount} = \text{principal} \times (100\% + \text{annual rate})$$

This formula is used to calculate the amount per year. If you want to find the amount after four years, then you have to use this formula four times. Example 1 illustrates this.

The interest earned in a term deposit can be found by using the following formula.



$$\text{Interest earned} = \text{amount} - \text{original principal}$$

When you invest in a term deposit, your money is committed for a specified period of time.

Example 1

Jerry Smith invests \$5000 in a 4-year term deposit at an annual rate of $8\frac{1}{2}\%$, compounded annually.

- What will the amount be after 4 years?

Solution:

First Year
Principal is \$5000. Rate is $8\frac{1}{2}\%$.

$$\begin{aligned}\text{Amount} &= \$5000 \times \left(100\% + 8\frac{1}{2}\%\right) \\ &= \$5000 \times 108\frac{1}{2}\% \\ &= \$5000 \times \frac{108.5}{100} = \$5425\end{aligned}$$

The amount after the first year is \$5425. \$5000 of this is the original principal, and \$425 is the interest earned in the first year.

Second Year
Principal is \$5425. Rate is still $8\frac{1}{2}\%$.

$$\begin{aligned}A &= \$5425 \times \left(100 + 8\frac{1}{2}\%\right) \\ &= \$5425 \times \frac{108.5}{100} = \$5886.13\end{aligned}$$

Third Year
Principal is \$5886.13. Rate is $8\frac{1}{2}\%$.

$$A = \$5886.13 \times \frac{108.5}{100} = \$6386.45$$

Fourth Year
Principal is \$6386.45. Rate is $8\frac{1}{2}\%$.

$$A = \$6386.45 \times \frac{108.5}{100} = \$6929.30$$

After 4 years the term deposit would be worth \$6929.30.

- How much interest did he earn after 4 years?

Solution:

The interest earned after 4 years would be
 $\$6929.30 - \$5000.00 = \$1929.30$.

This method of calculating the amount of a term deposit is very tedious. See the material following for an alternate method of calculating term deposits or compound interest by using a formula which makes it easier.

Remember, interest earned =
amount – original principal.

You may calculate the amount and the interest of a term deposit by using the following formula.



$$A = P(1 + i)^n$$

In this formula,

A = amount,

P = original principal,

i = interest rate, per compounding period, expressed as a decimal, and

n = number of compounding periods.

For Example 1, it is much easier if you use the formula.

$$A = ? \quad P = \$5000$$

$$i = 8\frac{1}{2}\% = \frac{8\frac{1}{2}}{100} = 0.085 \quad n = 4$$

$$\begin{aligned} A &= \$5000(1 + 0.085)^4 \\ &= \$5000(1.085)^4 \end{aligned}$$

The above should be worked out with a calculator. There are two ways of evaluating $(1.085)^4$.



1. Use the x^y function on your calculator.

$$x = 1.085$$

$$y = 4$$

$$\boxed{1.085} \boxed{x^y} \boxed{4} \boxed{=} \boxed{1.3858587}$$

2. Recall that

$$(1.085)^4 = 1.085 \times 1.085 \times 1.085 \times 1.085.$$

Regardless of what method you use,

$$(1.085)^4 = 1.3858587.$$

$$A = \$5000 \times 1.3858587 = 6929.2935.$$

$$A = \$6929.29 \text{ (rounded to the nearest cent)}$$

$$\begin{aligned} \text{Interest} &= \$6929.29 - \$5000.00 \\ &= \$1929.29 \end{aligned}$$

The interest earned after four years is \$1929.29.

You can see that knowing and using the formula will save you much time.

Notice that the difference in answers is \$0.01. This is due to rounding off in the first solution.

Depending on the type of calculator you own, the power key is either

$$\boxed{y^x} \text{ or } \boxed{x^y}$$

For example,

$$8\frac{1}{2}\% = \frac{8\frac{1}{2}}{100} = \frac{8.5}{100} = 0.085.$$

Example 2

Suzie Mah invested \$6000 in a term deposit at 8% per annum, compounded semiannually.

- What amount would Suzie have in this term deposit after 5 years?

Solution:

$$\text{Use } A = P(1+i)^n.$$

$$A = ? \quad P = \$6000$$

$$i = \frac{8\%}{2} = 4\% = 0.04 \quad n = 5 \times 2 = 10$$

$$\begin{aligned} A &= \$6000(1+0.04)^{10} \\ &= \$6000 \times (1.04)^{10} = \$6000 \times 1.480244285 \\ &= \$8881.47 \end{aligned}$$

The investment is worth \$8881.47.

- How much would be interest?

Solution:

$$\begin{aligned} \text{The interest amount is} \\ \$8881.47 - \$6000.00 = \$2881.47. \end{aligned}$$

As stated before, a short term deposit is from 30 days to less than 1 year. Bonds and trust companies offer different rates of interest depending on the length of the term. The following chart is an example of how the length of a term deposit and the annual interest rate are related.

Days	Annual Rate
30-119	9%
120-179	9.5%
180-364	10%

As you can see, the longer the term, the higher the interest rate.



$$\begin{aligned} \text{Interest earned} &= \\ &\frac{\text{principal} \times \text{annual rate}}{\text{number of days}} \\ &\times \frac{365}{} \end{aligned}$$

$$I = Prt$$

Example 3

Eddie Chan invested \$18 000 in a short term deposit for 60 days at an annual interest rate of 12%. How much interest will he earn at the end of this term?

Solution:

$$\text{Use } I = Prt$$

$$I = ? \quad P = \$18\,000 \quad r = 12\% \quad t = \frac{60}{365}$$

$$I = \$18\,000 \times \frac{12}{100} \times \frac{60}{365} = \$355.0684932$$

$$I = \$355.07$$

Eddie will earn \$355.07 after 60 days.

Round the answer to the nearest cent.

Now it is time to practice what you have learned.

Try the following questions.

- Find the total interest earned if interest is compounded annually.
Do any two parts of question 1.

Principal	Annual Rate	Amount After			Interest Earned
		1 year	2 years	3 years	
Example \$ 3 500	8%	\$3780	\$4082.40	\$4408.99	\$908.99
a. \$ 2 000	10.5%	i.	ii.	iii.	iv.
b. \$ 1 700	14%	i.	ii.	iii.	iv.
c. \$18 500	12.75%	i.	ii.	iii.	iv.

Example

a.

b.

c.

Do either question 2 or 3.

- Frieda Schmidt invested \$7500 in a 4-year term deposit at 11.5% compounded annually.

- What is the amount of the term deposit at maturity?
- What is the interest earned?

- Millie Marvel invested in a 5-year term deposit for \$10 000 at $8\frac{1}{2}\%$ compounded annually.

- Find the amount of the term deposit at maturity.
- Find the interest earned at maturity.

Do either question 4 or 5.

Use the chart below to answer questions 4 and 5.

Days	Annual Rate
30-59	9.50%
60-89	9.75%
90-119	10.00%
120-179	10.25%
180-364	10.50%

- Pat Vonstraum invested \$8000 in a short term deposit that is to mature in 75 days.
 - Find the interest rate she gets on her money.
 - Find the interest she earns at maturity.
- Wally Wallace invested \$6500 in a short term deposit to mature in 300 days.
 - Find the interest rate Wally gets on his money.
 - Find the interest he earns at maturity.



For solutions to Activity 1, turn to the Appendix, Topic 3.

Savings Bonds

A savings bond is like an I.O.U. When you purchase a savings bond, you are, in effect, loaning your money to the government or to a corporation. The government or corporation agrees to repay your loan, plus interest, at the end of an agreed-upon period of time.

Canada Savings Bonds (C.S.B.'s)¹ are issued and guaranteed by the federal government of Canada. The government of Canada sells C.S.B.'s in order to raise large sums of money that it uses to cover budgetary expenses. C.S.B.'s are available in \$100, \$500, \$1000, \$5000, and \$10 000 denominations. In 1988, the maximum amount of C.S.B.'s that one person could buy was \$75 000. C.S.B.'s mature 10 years after the date of purchase. The rate of return on a C.S.B. in 1988 was 9.5%, while the average rate of return on a basic savings account was only 6.5%. The interest rate on C.S.B.'s varies from year to year, but there is a minimum rate established. The interest rate you get will never be less than this established minimum rate.

There are two types of C.S.B.'s. A **regular interest bond** pays yearly simple interest. The interest payment is usually sent to the owner or put directly into his bank account. In a **compound interest bond**, the interest is allowed to accumulate so that interest is paid on previous interest.

The main advantage of C.S.B.'s is that they can be redeemed (cashed in) at any time for the face value plus any interest due.

When you purchase a C.S.B., most banks will show you a table showing the redemption value of a \$100 C.S.B. at the interest rate in effect at that time.

¹Revenue Canada. Reproduced by permission of the Minister of Supply and Services Canada.

The table below shows the minimum redemption value of a \$100 compound interest savings bond earning $9\frac{1}{2}\%$ interest for the first year and a minimum rate of 8% until maturity.

\$100 Compound Interest Canada Savings Bond

Years After Issue	Redemption Value
1	\$109.50
2	\$118.26
3	\$127.72
4	\$137.94
5	\$148.97
6	\$160.89
7	\$173.76
8	\$187.66
9	\$202.68
10	\$218.89

From the above table, you can see that a \$100 C.S.B. can be redeemed for \$218.89 at maturity. A \$500 C.S.B. can be redeemed for \$1094.45 ($\218.89×5). You can also calculate the interest earned by subtracting the buying price from the redemption value. For example, a \$500 C.S.B. would have earned interest of \$594.45 ($\$1094.45 - \$500.00 = \594.45).

Follow the example to learn how this table is used.

Example 4

Use the table provided to help solve these problems.

Ken Jensen spent \$2500 on C.S.B.'s.

- Find the redemption value after 7 years.

Solution:

$$\$173.76 \times 25 = \$4344.00$$

- Find the interest earned after 7 years.

Solution:

$$\$4344 - \$2500 = \$1844$$

After 7 years, Ken's redemption value would be \$4344, and his interest earned would be \$1844.

A **Guaranteed Income Certificate (G.I.C.)** is similar to a C.S.B. except that the interest rate is fixed for the life of the G.I.C., and the G.I.C. can only be redeemed at maturity. Most people buy C.S.B.'s because they can easily be turned into cash when needed.

Try the following questions.

Use the previous table entitled \$100 Compound Interest Canada Savings Bond.

6. Joe Banks purchased a \$5000 C.S.B. He redeemed it 4 years later.

- What was the redemption value of his C.S.B.?
- How much interest did he earn?

7. Mark Watters purchased \$7500 worth of C.S.B.'s.

- Find the redemption value after 9 years.
- How much interest did Mark earn?



For solutions to Activity 1, turn to the **Appendix, Topic 3**.

Treasury Bills

Another good way to invest your money is to buy a Canadian Treasury Bill (T-Bill for short). The minimum purchase order is \$10 000. T-Bills can be purchased through most banks and brokers.

When you purchase a T-Bill, you pay less than the face value of the T-Bill because the interest you accumulate is included in the face value of the T-Bill. To find what a T-Bill will cost, you have to use the following formula.



$$C = \frac{F}{1 + rt}$$

In this formula,

C = the original cost,

F = face value of the T-Bill,

r = rate, and

t = time (in years).

Follow the next example to see how this formula is used.

Example 5

Joe and Joanne Johnson purchased a \$20 000 Canadian T-Bill for 91 days at an interest rate of 12.5%. How much would Joe and Joanne have to pay for this \$20 000 T-Bill?

Solution:

$$C = \frac{F}{1 + rt}$$

$$C = ? \quad F = \$20\,000 \quad r = \frac{12.5}{100} \quad t = \frac{91}{365}$$

$$C = \frac{\$20\,000}{1 + \frac{12.5}{100} \times \frac{91}{365}} = \frac{\$20\,000}{1 + 0.031\,164\,3} = \frac{\$20\,000}{1.031\,164\,3}$$

$$C = \$19\,395.55$$

The Johnsons would have to pay \$19 395.55 for this \$20 000 T-Bill. Does this check out?

If the Johnsons invested \$19 395.55 at 12.5%, would they have \$20 000 after 91 days? (How much interest would they earn in 91 days?)

$$\text{Check: } I = Prt$$

$$\begin{aligned} I &= \$19\,395.55 \times \frac{12.5}{100} \times \frac{91}{365} \\ &= \$604.45 \end{aligned}$$

The interest after 91 days is \$604.45.

Since amount = principal + interest,
amount = \$19 395.55 + \$604.45
amount = \$20 000.

Thus, this checks out.

T-Bills are short term.

Interest is compounded annually.

T-Bills have a higher interest rate than most other savings plans.

The cost is the amount that you have to pay.

The face value refers to the value of the T-Bill at maturity. This is the amount that you will receive.

Note: T-Bills are issued for 91 days, 182 days, and 364 days only. (All are multiples of 91 days.)

Now try the following exercises. Do either question 8 or 9.

8. Joe Symak purchased a \$112 000 T-Bill at 11.75% for 91 days.
 - a. What would this T-Bill cost him?
 - b. How much interest does he earn?
9. Belinda Naidu bought a \$37 000 T-Bill for 182 days at a $10\frac{1}{2}\%$ rate of interest.
 - a. What would this T-Bill cost her?
 - b. How much interest would she earn?



For solutions to Activity 1, turn to the **Appendix, Topic 3.**

Registered Retirement Savings Plan

A Registered Retirement Savings Plan (R.R.S.P.) is a government-approved plan which allows a taxpayer to invest money and deduct a portion of the investment from the individual's taxable income. The government has rules and regulations governing the R.R.S.P. For example, there is a limit on the amount of the contribution per year. For 1988, the maximum contribution for a person without a company pension plan was 20% of the earned income or \$7500. Any portion of the R.R.S.P. or its entirety may be withdrawn depending on the terms of agreement, but the income is added to the regular income, and tax is payable on the total. An R.R.S.P. must be closed when the individual reaches age 71.

The following two examples show how you may benefit financially from investing in an R.R.S.P.

Example 6

Joe Badrock is self-employed and has an earned income of \$36 000. What is the maximum that he may contribute to an R.R.S.P.?

Solution:

The maximum contribution is 20% of your earned income (up to \$7500).

$$\$36\,000 \times 0.20 = \$7200$$

Joe may reduce his taxable income by \$7200 because he can contribute \$7200 to an R.R.S.P.

Example 7

Margaret Jones works for an oil company which has a compulsory pension plan. During the year, Margaret contributes \$2375 towards the company pension plan. If Margaret has an earned income of \$24 000, what is the maximum that she may contribute to an R.R.S.P.? If a person contributes to a company pension plan, then the maximum contribution to the pension plan and to R.R.S.P.'s is \$3500.

Solution:

The maximum is 20% of earned income (up to \$3500) less any company pension plan contributions.

$$\$24\,000 \times 0.20 = \$4800 \text{ (maximum is \$3500)}$$

$$\$3500 - \$2375 = \$1125$$

Margaret can invest \$1125 in an R.R.S.P.

Try the following questions.

Do either question 10 or 11.

10. John Henry is self-employed and has an earned income of \$35 500. What is his maximum R.R.S.P. contribution?
11. Henry John is a self-employed painter whose earned income was \$76 000 last year. What is his maximum R.R.S.P. contribution?

Do either question 12 or 13.

12. Jules Smith contributed \$850 to a company pension plan. If Jules' earned income was \$13 000, what would be his maximum R.R.S.P. contribution?
13. Marie Brosseau contributed \$2100 to a company pension plan. If her earned income was \$32 000, what would be her maximum R.R.S.P. contribution?



For solutions to Activity 1, turn to the **Appendix, Topic 3.**

You have now been exposed to a variety of investments and bank-centered savings plans that are designed to earn you money. Some investments have a good rate of return while others have a poor rate of return. Some investments have a high risk factor while others are a low risk.

The following chart allows you to compare various investments available to you. You may use this chart to help you decide how to invest your money.

Investments	Safety of Principal	Income	Liquidity	Cost	Tax Treatment
Savings accounts	high	poor	excellent	none	interest
Canada Savings Bonds	high	fair to good	excellent	none	interest
Investment Certificates	high	good	poor	none	interest
Term deposits	high	good	good	none	interest
Treasury Bill	high	good	good	none	interest

It is hoped that the information presented in this topic will help you make wise and informed investments. Good luck in your money management.

If you require help, do the Extra Help section.

If you want more challenging explorations, do the Extensions section.

} You may decide to do both.



Extra Help

The material on the use of the compound interest formula may not have been explained enough to result in a complete understanding of how it is used.

Study the following example to acquire more knowledge on how to use $A = P(1+i)^n$.

Recall: In $A = P(1+i)^n$,

A = amount,

P = principal,

i = rate of interest per period, and

n = number of compounding periods.

Example 8

Find the interest earned by each of the following investments. Round the answers to the nearest cent.

- \$6400 at 10% for 6 years, compounded semiannually

Solution:

$$A = ? \quad P = \$6400 \quad i = 5\% \quad n = 12$$

$$A = P(1+i)^n$$

$$A = \$6400(1+0.05)^{12}$$

$$A = \$6400(1.05)^{12}$$

$$A = \$6400(1.795\,856\,326)$$

$$A = \$11\,493.48$$

The amount at the end of 6 years would be \$11 493.48.

The amount of interest at the end of 6 years would be \$11 493.48 – \$6400.00 = \$5093.48.

Note: The rate per annum is 10%. So, for every half-year, it would be $\frac{10}{2} = 5\%$ or 0.05.

- \$15 343 at $12\frac{3}{4}\%$ for 4 years, compounded every four months

Solution:

$$A = ? \quad P = \$15\,343 \quad i = 4\frac{1}{4}\% \quad n = 12$$

$$A = P(1+i)^n$$

$$A = \$15\,343(1 + 0.0425)^{12}$$

$$A = \$15\,343(1.0425)^{12}$$

$$A = \$15\,343(1.647\,831\,36)$$

$$A = \$25\,282.68$$

The amount at the end of 4 years would be \$25 282.68.

The amount of interest at the end of 4 years would be
 $\$25\,282.68 - \$15\,343.00 = \$9939.68$.

Note: The rate per annum is $12\frac{3}{4}\%$. So, for every 4 months, it would be $12\frac{3}{4} \div 3 = 4\frac{1}{4}\%$ or 0.0425.

- \$78 000 at 12% for 3 years, compounded every month

Solution:

$$A = ? \quad P = \$78\,000 \quad i = 1\% \quad n = 36$$

$$A = P(1+i)^n$$

$$A = \$78\,000(1 + 0.01)^{36}$$

$$A = \$78\,000(1.01)^{36}$$

$$A = \$78\,000(1.430\,768\,784)$$

$$A = \$111\,599.97$$

The amount at the end of 3 years would be \$111 599.97.
 The amount of interest at the end of 3 years would be
 $\$111\,599.97 - \$78\,000.00 = \$33\,599.97$.

Note: The rate per annum is 12%. So, for every month, it would be $\frac{12}{12} = 1\%$ or 0.01.

For more practice, do the following questions.

1. Find the interest earned by each of the following investments. Round the answers to the nearest cent.

- a. \$3567 at $9\frac{1}{2}\%$ for 6 years, compounded semiannually
- b. \$10 043 at $11\frac{1}{4}\%$ for 2 years, compounded every three months
- c. \$105 600 at $13\frac{1}{2}\%$ for 3 years, compounded every two months



For solutions to **Extra Help**, turn to the **Appendix, Topic 3**.



Extensions

Another popular form of investment is taking a chance on Stock Markets or Stock Exchanges.

What Are Stocks?

A share of stock is a unit of ownership in a corporation. By the sale of stocks, a corporation can raise large sums of money needed to operate or expand the business. To give a return to the owners, the board of directors of the corporation may decide to pay out part of the profits to the shareholders. These payouts are known as **dividends**. The remaining profits are put back into the business to enable it to grow.

There are two different categories of stocks: preferred stocks and common stocks. A **preferred stock** is similar to a bond in many respects. It receives dividend payments at a fixed rate (much like the interest on bonds). The preferred shareholders have no voice in the management of the corporation as long as they have been receiving all promised dividends.

Common stocks carry with them the greatest risk of receiving no return on the investment, but they also have the greatest chance for large gains. Common stockholders split what is left after bond interest and preferred dividends have been paid. Thus, if the organization has made large profits, the common shareholders may receive larger dividends than the preferred stockholders. But, the reverse may also be true. The common stockholders also have some control over the management of the corporation. They are usually the people who elect the board of directors of the corporation on a one-vote-for-one-share basis. Thus, the more shares a person owns or controls, the larger that person's voice is in the election of management. If the business is not going well, the shareholders can decide to change the managers through the election process.

Pricing of Stocks

The price of a share depends on the law of supply and demand. That is, if stockholders wish to sell many shares, and no one wants to buy any, the price will fall. If, on the other hand, individuals wish to buy many shares, and no one is willing to sell at that price, the price will rise. The market will remain relatively stable when the buyers are willing to pay about the same price that the sellers are willing to accept.

Some factors which influence the price of stocks are the size of dividends paid on shares and the frequency of such dividends, the stability of the overall business, or a new discovery or product developed to be sold which should increase the profits. That is, if it appears that a business will continue to do well or if its profits will be rising, the shares in that corporation usually increase in value. The overall outlook for the country or market in which the corporation operates can influence the value of its stock.

Market prices for stocks or stock quotations are usually reported in most daily or weekly papers. Prices quoted for stocks are actual prices, not percentages, as is the case for prices of bonds.

Vancouver stocks Feb. 7

Complete tabulation of Monday transactions.
Quotations in cents unless marked \$. Net change
is from previous close of same lot type.

Stock	Sales	High	Low	Close	Net Ch'ge
Resource and Development					
Aalen	1000	18	18	18	+ 2
Adanac	1000	24	24	24	+ 1/4
Alton	1100	\$7 7/8	7 7/8	7 7/8	+ 2
And Mrs	27500	20	19	20	+ 16
Anglo Bo	77500	310	285	295	- 1/2
Arcdia	4500	23	22	23	- 1
Arex Rs	2500	20	20	20	- 1
Aroden	2200	17	17	17	- 2
Balfour	3500	57	56	56	- 2
Barler R	4000	60	60	60	- 2
Bath N	2500	60	58	60	+ 2
B mor	4000	60	60	60	
Benpel	1500	47	45	45	
B Giant	1500	10	10	10	
Bow Rvr	13500	31	29	31	+ 3
Bmedia	1100	140	136	136	
Bx Dev	700	167	167	167	- 5
C Barr	12500	31	31	31	
Cd Nat re	1900	385	380	385	
Canwx	4000	4 1/2	4 1/2	4 1/2	
Caroln	4600	150	145	150	
Casino	2200	20	20	20	

Look at the entry.

Prices are quoted in cents unless the symbol \$ is used.		23	22	23	- 1/2
Name of the stock It is usually an abbreviation.	Number of shares traded on this date	4500	Highest price of the day	Price of the last trade of the day	Difference between today's final trade and the previous day's final trade
			Lowest price of the day		

(Arcadia sold 4500 shares with a daily high of 23¢. The lowest trade was at 22¢. The daily close was 23¢. The closing price was down 1/2¢ from the previous day's closing price.)

There are several stock exchanges in Canada where the actual trading takes place. The largest of these are the Toronto, Montreal, and Vancouver Stock Exchanges. Each has its own method of reporting results, so the stock quotations may not give the same information as the clipping reporting on the Vancouver Stock Exchange.

Use the newspaper clipping to answer these questions.

1. How many shares of "B Giant" sold?
2. What is the closing price of "Canwx"?
3. What was the daily low for "Anglo Bo"?
4. Using the net change and the closing price, calculate the previous day's closing price for "Anglo Bo". (Hint: Since the price has risen 16¢, the previous close must have been 16¢ lower than today's close.)
5. Prices of stocks in excess of \$5 are usually quoted to the nearest $\frac{1}{8}$ of a dollar. How much is represented by the closing price of $7\frac{3}{8}$ for "Afton"? (Hint: What is $\frac{3}{8} \times \$1.00$?)



For solutions to Extensions,
turn to the **Appendix, Topic 3.**

Buying and Selling Stocks

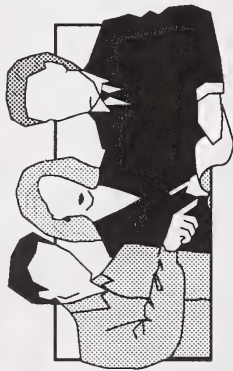
The buying and selling of stocks is quite similar to the trading of bonds. The stockbroker charges a commission to both the buyer and the seller. Most trading is done in board lots. The board lot or the basic unit of trading is usually 100 shares.

Commissions on stocks

- I. For transactions under \$100, a 10% fee is charged.
- II. For transactions over \$100, a minimum commission of \$15 is charged per trading day. Base Rate Commissions are as follows:
 - A. A 3% fee is charged on shares costing less than \$5 each.
 - B. For shares costing \$5 or more, but less than \$15, the commission is 2% plus \$0.05 per share.
 - C. For shares costing \$15 or more, the commission is 1% plus \$0.20 per share.

Example 9

What will the buyer pay, and what will the seller receive when 100 shares of Bolden International are traded at $\$11\frac{1}{8}$?



Solution:

Price per share is $\$11\frac{1}{8} = \11.125 .

Price for 100 shares = 11.125×100
= $\$1112.50$

Commission (2% + \$0.05 per share since share cost is $\$11\frac{1}{8}$)

Commission = $\$1112.50 \times 2\% + (\$0.05 \times 100)$ 100 is the number of shares.
= $\$1112.50 \times 0.02 + \5.00

= $\$22.25 + \5.00
= $\$27.25$

Buying price = price + commission

BP = $\$1112.50 + \$27.25 = \$1139.75$

Selling price = price - commission

SP = $\$1112.50 - \$27.25 = \$1085.25$

Thus, the buyer will pay $\$1139.75$, and the seller will receive $\$1085.25$.

Try the following questions on your own.

6. What is the selling price of 300 shares of Worldwide Kites at $\$6\frac{7}{8}$? (Commission rate is ____% + \$____ per share.)

Price of 300 shares =

Commission =

Selling price = ____ - ____ = ____

7. What is the buying price of 500 shares of CM & M at $\$29\frac{1}{2}$?

(Commission rate is ____% + \$____ per share.)

Price of 500 shares =

Commission =

Buying price = ____ + ____ = ____

8. If 300 shares of Sharvin Limited are traded at \$14, what is the total commission collected by the stockbroker from the buyer and the seller?



For solutions to Extensions, turn to the Appendix,
Topic 3.

Topic 4 Choosing a Chequing Account



Introduction

All chequing accounts are not the same, just as all savings accounts are not the same. In this topic, you will get to know more about chequing accounts so that you may choose the type of chequing account which best suits your needs.



What Lies Ahead

Throughout the topic you will learn how to

1. define the terms associated with a chequing account
2. compare different types and features of chequing accounts
3. examine the service charges associated with chequing accounts

Now that you know what to expect, turn the page to begin your study of choosing a chequing account.



Exploring Topic 4

Activity 1



Define the terms associated with a chequing account.

A chequing account has features that are not available in a savings account, which was discussed in **Topic 1**. The most important of these is the ability to write cheques. This allows you to virtually have all the money in your account with you by simply carrying your cheque book. It is much safer to carry a cheque book than to carry all your money with you.

Before you go any further, you should examine some of the terms associated with chequing accounts.

Cheque

A cheque is a piece of paper that directs the bank to deduct money from your chequing account. The money is then transferred to the person designated on the cheque.

Cheque Book

A cheque book is a book that usually contains cheques. Also in this book is a cheque register for keeping records of deposits, withdrawals, and other charges.

This cheque register is vital for keeping an accurate record of the balance in your account. Here is an example of a cheque register.

All of this information can be obtained from the cheque.

This is the amount in the bank before cheque number 18 was written.

Date	Chq. No.	Description	Amt. of Chq.	✓	Amt. of Deposit	Balance
Aug. 5	18	Mechanical repairs	\$26 95			\$472 35
						\$445 40

To find this balance, subtract \$26.95 from \$472.35.

By keeping an accurate register, you will see how much money you have in the bank, and you should never be overdrawn. The term "overdrawn" is explained next.

Overdrawn (OVD)

If you write a cheque on your account and there is not enough money in your account to cover this cheque, then your account is said to be overdrawn. If this does happen, then your cheque will be labelled NSF.

NSF Cheque - (Not Sufficient Funds)

An NSF cheque is one which will not be honoured because there is not enough money in the account to cover it. If possible, never write an NSF cheque. Knowingly writing cheques when you do not have any money in the bank is a criminal offense. Also, most banks will charge you a service charge if you write an NSF cheque. An NSF cheque can also be called an overdraft.

Service Charge (SC)

A service charge is the amount of money that the bank charges you to look after your account. Here is a list of some possible service charges.

- charge per cheque you write
- charge per month (regardless of how many cheques you write)
- charge for withdrawing money
- charge for an NSF cheque
- charge for overdraft interest
- charge for a certified cheque

Some banks have these charges, while others do not.

Returned Cheque (RTD) or Cancelled Cheque

This is a cheque that has already been written by you. The bank makes the appropriate withdrawal from your account and then returns the cheque to you usually after the end of the month. This cheque can be used to prove that a debt has been paid. This procedure also lets you know that the cheque has been cashed. Not all checking accounts, however, provide this service.

Certified Cheque (CC)

This is a cheque whose funds have been guaranteed. The bank makes sure that there are sufficient funds in your account to cover the cheque, and then certifies that the cheque will not "bounce" meaning that it will not be an NSF cheque. The word "certified" will appear on a certified cheque. There is a service charge to have a cheque certified.

Bank Statement

This is the bank's record of your account transactions. This statement is sent to you every month. The statement may be mailed with your cancelled cheques.

Now that you understand some of the terms associated with checking accounts, do the questions which follow. Then you will examine the types of checking accounts that are available.

1. What is an advantage of a checking account over a savings account?
2. What is a cheque book register?
3. What does it mean to be overdrawn?
4. What does the abbreviation NSF mean?
5. List four potential service charges associated with a checking account.
6. Why would someone want a cheque certified?



For solutions to **Activity 1**, turn to the **Appendix, Topic 4**.

Activity 2



Compare different types and features of chequing accounts.

Types of Chequing Accounts

Chequing accounts can be put into two basic groups.

- **Straight Chequing Account** – This account is more commonly known as a Personal Chequing Account. This type of account pays no interest on money in the account. It allows you to write cheques on your account.
- **Savings/Chequing Account** – This account is a combination of a savings and a chequing account. Interest is paid if you maintain a minimum balance in your account. Interest could be paid daily, monthly, or semiannually. You can also write cheques on this account.

Features of Chequing Accounts

There are a number of different features offered by different accounts and different banks. When you open a chequing account, it is important to be aware of the different services possible.

- **Overdraft Protection** – This allows you to be overdrawn on your account. The bank covers the amount that you are overdrawn and charges interest on this amount. There is usually a limit as to the amount of overdraft protection you can have (commonly \$1000.00).
- **Cancelled Cheques** – Some banks send you your cancelled cheques each month along with your monthly statement. Others will update your pass book at the bank. Both are ways of keeping a record of your account. Some banks will charge a small fee for returning your cancelled cheques.
- **U.S. Dollar Account** – This is a feature that might be of interest to people who live part-time in the United States or travel frequently to the United States. It keeps the dollar value of the funds in the account in U.S. dollars.
- **Duplicate Cheques** – Some accounts have duplicate cheques as a means of keeping records. That is, every time you write a cheque, a duplicate copy is made directly underneath the cheque.

Apply what you have learned to do the following questions.

1. What are the two main types of chequing accounts?
2. Which of the two types is better? Why?



For solutions to Activity 2, turn to the **Appendix, Topic 4.**

Activity 3



Examine the service charges associated with chequing accounts.

Most financial institutions charge a fee for the services which they provide. These fees are then deducted from the account. These deductions may be done monthly, quarterly, semiannually, or yearly. The following are examples of charges that banks and other financial institutions assess their customers.

- **Charges for Cheques Written** – When opening a chequing account, you should be aware of the manner in which you will be charged for each cheque you write. Most commonly, you are charged monthly for each cheque written during the month. This could be a charge of 25¢ per cheque. If you write many cheques each month, you might want an account that charges you a fixed rate each month and allows you to write as many cheques as you want. Usually, charges in this manner are part of an entire service package. This could be a minimum flat rate of \$2.50 or more per month.

- **Service Package** – This package gives you many benefits for one service charge per month (that is, \$7.50 per month). If you use many services, your total charge per month may be less than the combined charge for each service. Some of the services provided may include the following:

- no charge for writing cheques
- overdraft protection
- no service charge for travellers' cheques
- no service charge for money orders
- no service charge for certified cheques
- no service charge for a safety deposit box
- no charge for paying utility bills

- **Charges for Withdrawals** – Some banks charge you for making cash withdrawals from your account. You should be aware of this feature, particularly if you make money withdrawals during the month.

Withdrawal means that you are "taking out" or withdrawing money from your account.

Now do the questions which follow.

1. What are the seven most common features included in a chequing service package?
2. A bank charges 25¢ per cheque or \$2.00 per month for unlimited chequing. Jane determined the average number of cheques she wrote per month to be 11. Which method should she choose? Show your work to indicate why you made your choice.
3. A certain bank charges the following service fees:
 - 32¢ for each cheque written
 - 50¢ for each utility bill paid at the bank
 - \$2.50 for each overdraft on an account
 - 40¢ for each withdrawal

What would the total fee be in each of the following situations?

- a. Cheques written: Withdrawals:

March - 11	March - none
April - 14	April - 6
May - 9	May - 4

Utility bills paid:

- | |
|-----------|
| March - 3 |
| April - 2 |
| May - 4 |

- b. Cheques written: Withdrawals:

November - 3	November - 5
December - 12	December - 5
January - 4	January - none
- Utility bills paid: Overdrafts:

November - 3	November - none
December - none	December - 2
January - 6	January - 1



For solutions to Activity 3, turn to the Appendix,
Topic 4.

If you require help, do the Extra Help section.

If you want more challenging explorations, do the Extensions section.

} You may decide to do both.



Extra Help

There are certain points you should remember about a chequing account.

- A chequing account is usually used to pay for ordinary, everyday expenses.
- A straight chequing account does not pay interest.
- Writing cheques on a chequing account is much more convenient and safer than carrying large sums of cash.
- After a cheque is written, a record of this should be made to determine what the new balance will be.
- If an overdraft is made, the bank will charge a substantial fee.
- Services fees are charged for such services as the following: writing cheques, making withdrawals, paying utility bills, overdrafts.
- The bank issues a monthly statement of the transactions and mails it to the customer together with the cancelled cheques.

- Cancelled cheques can be used as proof that payment has been made.

Try the following question.

1. Find the total amount of service fees paid on a chequing account if each account has the specified transactions during a particular four-month period. The fee schedule to use for both question parts is the following:

- 32¢ for each cheque written
- 50¢ for each utility bill paid at the bank
- \$2.50 for each overdraft on an account
- 40¢ for each withdrawal

a. Cheques: Withdrawals:

January	- 6	January	- 2
February	- 2	February	- 6
March	- 8	March	- 4
April	- 4	April	- 0

Utility bills: Overdrafts:

January	- 1	January	- 0
February	- 5	February	- 2
March	- 3	March	- 1
April	- 3	April	- 0

b.

Cheques :		Withdrawals:	
May	- 5	May	- 2
June	- 6	June	- 2
July	- 3	July	- 6
August	- 5	August	- 4

Utility bills:		Overdrafts:	
May	- 3	May	- 0
June	- 3	June	- 0
July	- 1	July	- 2
August	- 5	August	- 2



For solutions to **Extra Help**, turn to the **Appendix**,
Topic 4.



Extensions

A straight chequing account is used strictly for paying bills, mortgages, and loans. Such an account does not pay interest on balances at any time of year.

A savings/chequing account provides the same privileges as a straight chequing account and also pays interest at specified time periods during the year. The most common interest periods for such accounts are every month or every six months. After the interest is calculated on the lowest balance for that particular time period, it is added to the monthly balance or the six-month balance.

A very popular savings/chequing account is one which pays interest on each day's balance. It is called a daily-interest account. The interest is not compounded daily. The amount earned every day during a month is totalled and added to the monthly balance. This means that the interest is compounded monthly. This type of account allows two free withdrawals or cheques during the month. Any withdrawal or cheque-writing beyond the two free ones are subject to a stiff service fee which is usually in the range of \$2.50 per withdrawal or per cheque.

Try the following questions.

Each of the following is a savings/chequing account. Find the balance for each as per time period specified.

1. Interest is added every 6 months at 9% per annum and is calculated on the lowest balance for that period. For this question, assume the lowest balance is \$469.36. Services fees are as shown below.

- 32¢ for each cheque written
- 50¢ for each utility bill paid at the bank
- \$2.50 for each overdraft on an account
- 40¢ for each withdrawal

The balance forward from April is \$469.36.

May - cheques written:

car payment - \$ 239.60
groceries - \$ 436.67
utilities (3) 1 cheque - \$ 115.63

Deposits:

income - \$1453.63

June - cheques written:

car payment - \$ 239.60
groceries - \$ 243.60
utilities (3) 1 cheque - \$ 123.60

Deposits:

income - \$1453.63

July - cheques written:

car payment - \$ 239.60
groceries - \$ 369.37
utilities (3) 1 cheque - \$ 95.63

Deposits:

income - \$1463.63
garage sale profits - \$ 363.50

August - cheques written:

car payment - \$ 239.60
groceries - \$ 279.55
utilities (3) 1 cheque - \$ 83.63
church dues - \$ 65.00
donation to charity - \$ 150.00

Deposits:

income - \$1463.63
self-earnings during evening - \$ 265.35

September - cheques written:

last car payment - \$ 105.34
groceries - \$ 456.39
utilities (3) 1 cheque - \$ 123.64
charge account - \$ 936.42

Deposits:

income - \$1463.63

October - cheques written:

- groceries - \$ 389.60
- utilities (3) 1 cheque - \$ 163.40
- new carpet for house - \$3960.42
- winter clothing for children - \$ 463.42

Deposits:

- income - \$1463.63
- sale of older second vehicle - \$1100.00

2. Interest is added every month at 9% per annum, calculated on the balance for each month.
Assume deposits are made on the first day of each month.

Service fees are as follows:

- The first withdrawal or cheque is free. For each additional withdrawal or cheque made each month, the charge is \$0.75.
- Utility bills cost \$0.50 each for service fee.

The balance forward is \$2063.95.

July

Three cheques written

(\$655.10; \$306.39; \$76.42)

Two withdrawals made (\$200.00; \$60.00)

Three utility bills paid in cash (total - \$69.53)

Deposits of \$500.00 and \$1450.00 made

August

Three withdrawals made

(\$43.00; \$263.00; \$45.00)

Three utility bills paid in cash (total - \$84.39)

Deposits of \$500.00 and \$1450.00 made

September

Four cheques written

(\$13.65; \$267.14; \$366.93; \$89.16)

One withdrawal made (\$550.00)

Three utility bills paid in cash (total - \$94.86)

Deposits made (\$500.00; \$1450.00; \$936.45)



For solutions to Extensions, turn to the Appendix, Topic 4.

Topic 5 The Chequing Account



Introduction

Just knowing the advantages of a chequing account is not enough. Knowing how to use one wisely is of utmost importance. The material and examples in this topic should help you set up and use a chequing account in a rational and advantageous manner.



What Lies Ahead

Throughout the topic you will learn how to

1. complete cheques, deposit slips, and withdrawal slips
2. keep personal records of cheques written and deposits made
3. reconcile a bank statement with personal records

Now that you know what to expect, turn the page to begin your study of the chequing account.



Exploring Topic 5

Activity 1



Complete cheques, deposit slips, and withdrawal slips.

Chequing Accounts

To open a chequing account, all you need to do is go to a bank and apply. The bank clerk will record the necessary information which you must provide. Normally, two pieces of identification will be needed. A deposit into your account will be necessary to activate the account. At this time, you will be given some blank cheques. See the following section on how to complete a cheque.

Writing Cheques

After you have opened a chequing account and made a deposit, you may write cheques. A cheque directs the bank to deduct money from your chequing account to make a payment. Your account must contain as much money as the amount of the cheque you are writing so as to avoid overdrawing your account.

Example 1

Joe Willis paid for a bill at the Happyland Car Mart on August 5, 1988, for \$26.95. How should Joe write the cheque?

Solution:

Step 1: Write the date.

Step 2: Write the name of the person or company to whom the cheque is payable.

Step 3: Write the amount of the cheque as a numeral.

Step 4: Write the amount of the cheque in words and cents. Put a line in the remaining space so that nothing else can be added.

Step 5: Write in the account number.

Step 6: Sign the cheque.

The completed cheque should look like the following one.

Sample Cheque

This number shows that this is the 18th cheque that Joe has written so far.

No. <u>18</u>		The Bank of Alberta		<u>AUG. 5</u> 19 <u>88</u>	
PAY TO THE ORDER OF		<u>HAPPYLAND CAR MARJ</u>		\$ <u>26.95</u>	
<u>~~~~~ TWENTY SIX ~~~~~</u>		<u>~~~~~</u>		<u>95</u> Dollars 100	
Charge to Account No. <u>2536</u>		<u>Joe Willie</u>			
000100245					

Your signature should be the normal way of signing your name. It should be written, not printed or typed.

Important:

Never sign a cheque without filling in all the blank spaces.

Now that you are able to write a cheque, look at Example 2 which shows you how to make a deposit to your chequing account.

Example 2

On August 5, 1988, Janet Joseph deposited into her chequing account, #254108, a cheque for \$750.00. She also withdrew \$85.00 in cash. How did she complete the deposit form?

Solution:

ALBERTA BANK		DEPOSIT	
THE BANK OF ALBERTA			
DATE <i>Aug. 5, 1988</i>	DEPOSITOR'S INITIALS <i>JJ</i>	CASH	\$750 00
		CHEQUES/ COUPONS	
		SUB TOTAL	\$750 00
SIGNATURE - CASH RECEIVED <i>JANET JOSEPH</i>		LESS CASH	\$ 85 00
		AMOUNT	
BRANCH NO. <i>WILNA</i>	ACCOUNT NO. <i>254108</i>	NAME - (PLEASE PRINT) JANET JOSEPH	
		\$	665 00

Now that you know how to make a deposit, how should a withdrawal be made?

A deposit is money you put into your account.

NOTE: The only time you have to sign your name on the deposit slip is when you make a cash withdrawal at the time of deposit.

Withdrawals From a Chequing Account

A withdrawal from your chequing account is like writing a cheque. Many people write a cheque to themselves or to "cash" to withdraw money from their chequing accounts. Some banks have forms to complete. Here is an example of how you would complete a chequing account withdrawal form.

A withdrawal is taking money out of your account.

Example 3

On February 26, 1988, John Bonter wants to take \$83.00 out of his chequing account, #51375. How does he complete the withdrawal form?

Solution:

ALBERTA BANK	WITHDRAWAL	Feb. 26	19 88
RECEIVED FROM	The Bank of Alberta	\$	83 $\frac{00}{100}$
	Eighty-Three		xx DOLLARS
ACCOUNT NO.	51375		John Bonter
			(PLEASE SIGN IN FRONT OF BANK OFFICER)

Do the following questions.

- Fill in the blank cheque below to cover the purchase of a 10-speed bicycle that cost \$165.50. Harvey Wentworth bought the bicycle from The Western Bike Shop on August 25, 1988.

National Bank	
PAY TO THE ORDER OF _____ \$ _____	_____ 19____
NO. <u>202</u> 08040 070	_____ DOLLARS 100

- On February 6, 1989, Mark Dollars deposited into his chequing account, #364103, a cheque for \$1025.37 and cash amounting to \$12.50 in change. He also withdrew \$237.00 in cash. Show how he would complete the deposit slip.

ALBERTA BANK		DEPOSIT	
DATE _____	DEPOSITOR'S INITIALS _____	CASH CHEQUES/ COUPONS	
SIGNATURE - CASH RECEIVED _____		SUB TOTAL	
BRANCH NO. _____		LESS CASH	
ACCOUNT NO. _____	NAME - (PLEASE PRINT) _____	AMOUNT \$ _____	

3. On May 9, 1989, Jane Whistle wants to take \$123.60 out of her chequing account, #5634004.
How does she complete the withdrawal slip?

ALBERTA BANK	WITHDRAWAL	_____ 19____
RECEIVED FROM	The Bank of Alberta	\$ _____
ACCOUNT NO. _____	_____ DOLLARS	_____ 00
(PLEASE SIGN IN FRONT OF BANK OFFICER) _____		

4. When do you have to sign a chequing account deposit slip?



For solutions to Activity 1, turn to the Appendix, Topic 5.

Activity 2



Keep personal records of cheques written and deposits made.

Keeping Records

When a cheque is written or a deposit is made to your account, a record should be kept. It is important to know how much money you have in your account to avoid a possible overdraft. The two most common ways of keeping a record of your account transactions are by using one of the following methods.

- a cheque stub
- a cheque register (more common)

Examine these two ways of keeping a record of your account transactions.

Cheque Stubs

When a cheque is written, the **stub** should be filled in completely. The stub is a record of the cheque that stays in the cheque book. Example 4 will help you to fill in this stub.

Here is an example of a blank stub. Cheque stubs are located on one side of the cheque. The cheque should be detached from the stub. The stub is your record that the cheque was written.

No.		
	19	
TO		
	\$	
BALANCE	\$	
DEPOSIT	\$	
TOTAL	\$	
CHEQUE	\$	
BALANCE	\$	

Example 4

If the balance brought forward was \$436.85 and a deposit of \$96.00 was made, how should Joe complete the stub for a cheque of \$26.95 to Happyland Car Mart.

Solution:

Step 1: Fill in the top of the stub by using the information from the cheque.

Step 2: List the balance brought forward from the last stub.

Step 3: List all deposits since the last stub was completed.

Step 4: Add to find the total.

Step 5: List the amount of this cheque.

Step 6: Subtract to find the balance that should be carried forward to the next stub.

No. 18

Aug. 5 19 88

TO Happyland

Car Mart

\$ 26.95

BALANCE	\$	436	85
DEPOSIT	\$	96	00
TOTAL	\$	532	85
CHEQUE	\$	26	95
BALANCE	\$	505	90

Cheque Registers

You use a cheque register to keep a record of the deposits you make and the cheques that you write. The balance is the amount of money in your account. When you make a deposit, add the amount of the deposit to the balance. When you write a cheque, subtract the amount of the cheque from the balance.



New balance = previous
balance + deposit amount
– cheque amount

Always double-check your calculations to be sure you end up with the correct balance.

The cheque register should be put at the front or the back of your cheque book.

Example 5

John Brezinski's chequing account had a balance of \$1560.50. He wrote a cheque on July 3 for \$256.85, another cheque on August 5 for \$315.00, and he made a deposit on August 28 for \$136.70. Show how John would fill in his cheque register.

Solution:

CHEQUE NO.	DATE	CHEQUES ISSUED TO OR DESCRIPTION OF DEPOSIT	AMOUNT OF CHEQUE	AMOUNT OF DEPOSIT	BALANCE
BALANCE BROUGHT FORWARD -					\$1560 50
26	7/3	House Insurance	\$256 85		\$1303 65
27	8/5	Car Repair	\$315 00		\$ 988 65
	8/28	Gas Rebate		\$136 70	\$1125 35

John has a new balance of \$1125.35.

Do the following questions.

- Complete the cheque stubs below. Find the balance carried forward.

a.

Balance	\$	172	50	
Deposit	\$			
Total	\$			
Cheque	\$	46	95	
Balance	\$			

b.

Balance	\$	359	30	
Deposit	\$	62	45	
Total	\$			
Cheque	\$	289	75	
Balance	\$			

ADD when making a deposit.
SUBTRACT when writing a cheque.

2. The balance brought forward was \$126.80. Deposits of \$80.50 and \$20.30 were made. The amount of a cheque was \$120.00. Find the balance carried forward to the next stub.
3. Find the new balance after each cheque or deposit.

AMOUNT OF CHEQUE	AMOUNT OF DEPOSIT	BALANCE
BALANCE BROUGHT FORWARD		\$269 80
\$ 84 60		
	\$105 00	
\$100 00		

4. Sharon O'Flanagan's cheque register was \$476.90 on July 18, 1988. Her cheque register shows the transactions since then. Fill in the new balance after every transaction.

CHEQUE NO.	DATE	PARTICULARS	AMOUNT OF CHEQUE	✓	AMOUNT OF DEPOSIT	BALANCE
	8/18	BALANCE FORWARD				\$476 90
462	8/26	FOOD MART	\$115 30			
463	9/5	PHONE BILL	\$ 76 30			
	9/14	CASH ADVANCE			\$300 00	
464	9/15	TELEPHONE	\$112 50			
465	9/26	MARY'S ELECTRICAL	\$230 00			
	9/30	WORK CHEQUE			\$550 00	



For solutions to Activity 2, turn to the Appendix, Topic 5.

Activity 3



Reconcile a bank statement with personal records.

The bank keeps a record of all your account transactions. At the end of each month, the bank will send you a bank statement showing all the transactions that occurred during that month.

Bank Statements

When you have a chequing account, you receive a statement and cancelled cheques from the bank each month. Cancelled cheques are the cheques which the bank has paid by deducting money from your account. Your statement lists all the cheques that the bank has paid and the deposits that the bank has recorded since your last statement. The statement may include a service charge for handling the account.

Here is a sample bank statement. (These vary from bank to bank.)

THE BANK OF ALBERTA

STATEMENT OF ACCOUNT

PLEASE NOTIFY US OF ANY CHANGES IN YOUR ADDRESS

ACCOUNT NO.

4917684

PAGE

1

STATEMENT DATE

5 Dec 88

ENCLOSURES

John B. Michaels

1257 Blackhorn Dr.

Bather, AB.

T5H 7A5

BALANCE FORWARD FROM PREVIOUS STATEMENT

1048.03

OVERDRAWN

BALANCE

DESCRIPTION - DEBITS/CHEQUES	DEPOSITS/ CREDITS	DATE M D
ATM-DEP	250.00	1110
ATM-WD	50.00	1110
DEP	50.00	1114
TRNSFR	100.00	1114
CHEQUE 101	675.00	1124
ATM-DEP	210.00	1201
CHEQUE 103	235.32	1204
SERVICE CHARGES	0.58	1205
		1298.03
		1248.03
		1298.03
		1398.03
		723.03
		933.03
		697.71
		697.13

NO. DEBITS	TOTAL AMOUNT-DEBIT	NO. CREDITS	TOTAL AMOUNT-CREDIT	LAST STMT
4	960.90	4	610.00	06 NOV

PLEASE CHECK THIS STATEMENT WITHOUT DELAY

THE BANK MUST BE NOTIFIED IN WRITING OF ANY ERROR OR OMISSION WITHIN 30 DAYS

ATM-DEP stands for automatic teller deposit showing that the bank machine was used.

ATM-WD stands for automatic teller withdrawal. The bank machine was used to withdraw money.

Debit means a withdrawal. Credit means a deposit.

The statement reflects John Michaels' chequing account for November 6 to December 5.

The first column describes the various transactions which John had over the month. Banks frequently use codes to describe transactions. The codes are generally defined on the back of the statement or in a passbook (as in the savings account). The following are some frequently-used codes.

DEP - Deposit
WD - Withdrawal
SC - Service Charge
ATM - Automated Teller Machine (bank machine)
TRANSFR - Transfer (from one account to another)

The second column lists all the "debits" or entries which take money out of the account.

The third column lists all the "credits" or entries which put money into the account.

The fourth column is the date column. This allows you to know when the transaction occurred.

The last column gives the balance. The last number will be carried forward to the next statement.

Now that you have the bank statement, you will want to see how it compares with your register. This is called "reconciling the bank statement."

Reconciling the Bank Statement

When you receive your bank statement, you compare the cancelled cheques, the deposits, and your cheque register to be sure they agree. You may find some outstanding cheques and deposits which appear in your register but which did not reach the bank in time to be processed and listed on your statement. You reconcile the statement to make sure that it agrees with your cheque register.

This means that you must make the balance from your cheque register and the bank statement agree.

Steps in Balancing Your Bank Statement With Your Cheque Register

Step 1: Compare the amount and number of each cheque in your cheque register with the cancelled cheques and with the amount in your bank statement.

Step 2: Place a check mark (✓) in your cheque register beside each amount that agrees with the bank statement. Do not check off those items in your cheque register that do not appear in the bank statement.

Step 3: Add all outstanding deposits and **subtract** all outstanding cheques from the balance on the bank statement. This gives the adjusted statement balance.

Step 4: Subtract any service charges from your cheque register balance. This is the adjusted cheque register balance.

Reminder: Add and subtract from your bank statement.

Step 5: If your adjusted statement balance equals your adjusted cheque register balance, your bank statement is reconciled with the adjusted balance showing the true amount in your chequing account.

The following is Mary Hastings' bank statement for May.

Compare this bank statement to the part of the cheque register on the next page. In the cheque register put a tick mark in the "✓" column for each cheque and each deposit that agrees with the corresponding item in the bank statement. Do not check off those items that do not appear on the bank statement.

NATIONAL BANK "The Best Bank in the West"				
MARY HASTINGS 145 E 75th St. CITY, PROVINCE		345 6780 ACCOUNT NUMBER	04 BRANCH	
		PAGE	5	30
		7	PERIOD ENDING	88
DATE	DESCRIPTION	DEBITS	CREDITS	BALANCE
Apr. 29	Balance Forward			1375 80
May 02	Cheque 13	21 30		1354 50
03	Cheque 14	15 00		1339 50
03	Cheque 15	145 65		1193 85
05	Cheque 16	100 00		1093 85
09	Cheque 17	16 75		1077 10
10	Cheque 18	115 00		962 10
12	Cheque 19	70 00		892 10
16	Deposit		930 65	1822 75
17	Cheque 20	32 50		1790 25
19	Cheque 21	43 00		1747 25
25	Deposit		125 00	1872 25
27	Cheque 22	285 00		1587 25
30	Cheque 24	82 90		1504 35
30	Deposit		1620 95	3125 30
30	Service Charge	2 75		3122 55
	Cheques -11 Deposits - 3	929 85	2676 60	3122 55
	FINAL TOTALS			

Mary Hastings' cheque register is shown next.

Date	No.	Particulars	✓	Cheques	Deposits	Balance
April 30		Balance Forward	✓			\$1375.80
30	13	Telephone	✓	\$ 21.30		\$1354.50
30	14	Car Club	✓	\$ 15.00		\$1339.50
30	15	Charge Account	✓	\$145.65		\$1193.85
May 04	16	Cash	✓	\$100.00		\$1093.85
04	17	Florist	✓	\$ 16.75		\$1077.10
07	18	Plumber (water heater)	✓	\$115.00		\$ 962.10
07	19	Life Insurance	✓	\$ 70.00		\$ 892.10
16		Paycheque	✓		\$ 930.65	\$1822.75
16	20	Sporting Goods (runners)	✓	\$ 32.50		\$1790.25
17	21	Dentist	✓	\$ 43.00		\$1747.25
25		Sale of lawn mower	✓		\$ 125.00	\$1872.25
25	22	Car Insurance	✓	\$285.00		\$1587.25
26	23	Electricity	✓	\$ 47.33		\$1539.92
26	24	City Lumber Co.	✓	\$ 82.90		\$1457.02
28	25	C & W Market (groceries)	✓	\$125.49		\$1331.53
30		Paycheque	✓		\$1620.95	\$2952.48
31		Interest on shares	✓		\$ 135.00	\$3087.48

Make note of the following:

- outstanding deposits \$135.00
- outstanding cheques $\$47.33 + \$125.49 = \$172.82$
- service charges \$2.75

The adjusted statement balance is

$$\$3122.55 + \$135.00 - \$172.82 = \$3084.73.$$

Note: $\$3122.55$ is the final balance in the bank statement.

$\$3087.48$ is the final balance in the cheque register. In this example,

$\$3084.73$ is the true amount in Mary's chequeing account.

The adjusted cheque register balance is

$$\$3087.48 - \$2.75 = \$3084.73.$$

If the adjusted statement balance and the adjusted cheque register balance are the same, then your bank statement is reconciled. If the two values are not the same, then there is an error in either your cheque register or the bank statement.

To complete this topic, do the questions which follow.

Use the following bank statement to answer questions 1 to 7.

THE BANK OF

ALBERTA

STATEMENT OF ACCOUNT

PLEASE NOTIFY US OF ANY CHANGES IN YOUR ADDRESS

Bev J. Fritmont

8295 Section Drive

Cabent, AB

T4H 3K7

ACCOUNT NO.

215-403

PAGE

1

STATEMENT DATE

April 5

ENCLOSURES

3

OVERDRAWN

BALANCE

428.32

BALANCE FORWARD FROM PREVIOUS STATEMENT

428.32

DESCRIPTION - DEBITS/CHEQUES	DEPOSITS/ CREDITS	DATE M D
DEP	321.45	0308
TRNSFR	250.00	0315
ATM-DEP	32.12	0316
ATM-DEP	243.79	0316
CHEQUE 342	409.15	0325
CHEQUE 339	81.00	0326
CHEQUE 343	10.00	0327
SERVICE CHARGES	0.75	0405
		749.77
		499.77
		775.68
		366.53
		285.53
		275.53
		274.78

NO. DEBITS

5

TOTAL AMOUNT-DEBIT

750.90

NO. CREDITS

3

TOTAL AMOUNT-CREDIT

597.36

LAST STMT

06 MAR

PLEASE CHECK THIS STATEMENT WITHOUT DELAY

THE BANK MUST BE NOTIFIED IN WRITING OF ANY ERROR OR OMISSION WITHIN 30 DAYS

1. What was the previous balance?
2. What was the service charge?
3. What were the total credits?
4. How many deposits were made at a banking machine?
5. What is the account number?
6. What is the cheque number corresponding to a cheque processed on March 25?
7. What was the balance after the transfer was made?
8. Reconcile the bank statement information with the cheque register balance. Find the true amount in each chequing account.
 - a.
 - Bank statement ending balance of \$572.75
 - Outstanding deposits for \$76.25 and \$128.50
 - Outstanding cheques for \$51.20, \$18.95, and \$151.00
 - Service charge of \$6.50
 - Cheque register balance of \$562.85
 - b.
 - Bank statement ending balance of \$123.51
 - Outstanding deposits of \$75.00, \$500.00, and \$130.25
 - Outstanding cheques for \$175.00 and \$279.95
 - Service charge of \$1.50
 - Cheque register balance of \$375.31



For solutions to Activity 3, turn to the Appendix, Topic 5.

If you require help, do the Extra Help section.

If you want more challenging explorations, do the Extensions section.

You may decide to do both.



Extra Help

Chequing accounts are used to pay bills and to provide extra cash for various personal needs during the month. The extra money needed does not have to be withdrawn from any savings account that a person may have. The service charge for writing cheques and for withdrawals is usually the same.

If a financial institution issues a monthly statement, it should be checked closely with a personal record of transactions made during any particular month. This is called reconciling a bank statement.

Do the following questions.

1. Reconcile the following bank statement information with the cheque register balance. Determine the true amount in the account.

Ending balance of bank statement	a.	b.	c.
Outstanding deposits	\$ 436.05	\$1066.39	\$3301.46
	\$ 200.60	\$ 45.79	\$1063.45
	\$ 971.75	\$ 329.07	\$ 207.53
	\$ 306.16	\$ 600.51	\$ 27.10
			\$ 331.39
Outstanding cheques	\$ 39.37	\$ 456.73	\$ 336.16
	\$ 233.16	\$ 107.14	\$ 42.98
	\$ 105.66		\$ 603.45
			\$ 79.11
Service charge	\$ 12.63	\$ 32.17	\$ 53.95
Cheque register balance	\$1549.00	\$1510.06	\$3923.18

2. Define each of the following terms.

- a. service charge
- b. interest
- c. principal
- d. deposit slip
- e. passbook
- f. bank statement
- g. cheque register
- h. withdrawal slip
- i. cheque
- j. certified cheque



For solutions to **Extra Help**, turn to the **Appendix**,
Topic 5.



Extensions

This section will provide questions which require more thinking and thus, more challenging. Try these to gain even more knowledge and enjoyment. Each of the following is a chequing/savings account. Calculate these questions as simple interest.

1. Find I , to the nearest cent, when

$$P = \$3604.35,$$

$$r = 8.75\% \text{ per annum, and}$$

$$t = 45 \text{ months.}$$

2. Find P , to the nearest cent, when

$$I = \$945.70,$$

$$r = 10\frac{1}{2}\%, \text{ and}$$

$$t = 1\frac{1}{2} \text{ years.}$$

3. Find r , to the nearest hundredth, when

$$I = \$605.45,$$

$$P = \$3002.63, \text{ and}$$

$$t = 2 \text{ years.}$$

4. Find t , to the nearest hundredth of a year, when

$$I = \$507.00,$$

$$P = \$56\,345.00, \text{ and}$$

$$r = 7\frac{1}{4}\%.$$

5. Mr. Jingle Pockets opened two chequing/savings accounts as outlined below.

Investment #1 - \$10 480 was invested at $10\frac{1}{2}\%$ per annum, compounded every 6 months for 4 years.

Investment #2 - \$15 230 was invested at 6% per annum, compounded every 3 months for 4 years.

- How much interest did each deposit earn? How much interest in all was earned?
- How much money in total did he have at the end of the four-year period?



For solutions to Extensions, turn to the Appendix, Topic 5.

Unit Summary



What You Have Learned

Having completed this unit, you should

1. be familiar with savings accounts, banking terminology, and the various forms used in banks
2. be able to calculate simple interest
3. be able to calculate compound interest through repeated simple interest or by using tables
4. be able to calculate your investment earnings with regards to bank-centered savings plans
5. discuss the features of chequing accounts
6. write cheques
7. complete deposit slips
8. complete withdrawal slips
9. keep a record of your account transactions
10. reconcile your bank statement

You are now ready to
complete the **Unit Assignment**.



Solutions

Review

Topic 1

Savings Accounts

Topic 2

Interest

Topic 3

Savings Through Other Investments

Topic 4

Choosing a Chequing Account

Topic 5

The Chequing Account



Review

1. a. $10\% = 0.10$ b. $1\% = 0.01$
- c. $7\frac{1}{2}\% = 0.075$ d. $15\frac{3}{4}\% = 0.1575$

Note: To change any percent to a decimal, divide by 100.
For example, $10\% = 10 \div 100$

$$= 0.10$$

2. a. 6 months = $\frac{6}{12} = \frac{1}{2}$ year
- b. 70 days = $\frac{70}{365} = \frac{14}{73}$ year
- c. 18 months = $\frac{18}{12} = \frac{3}{2}$ year
- d. 360 days = $\frac{360}{365} = \frac{72}{73}$ year
3. a. $\$57.936 = \57.94
- b. $\$1570.413 = \1570.41
- c. $\$7.935 = \7.94
4. a. $\$145.36 + \$57.25 + \$118.76 = \321.37
- b. $\$1760.45 - \$59.31 + \$1.74 - \$0.38 = \$1702.50$
- c. $\$889.75 - \$51.24 - \$118.70 + \$26.25 = \$746.06$

5. a. $\$7.83 \times 12 = \93.96
- b. $\$1546.18 \div 12 = \$128.8453 = \$128.85$
- c. $\$52.49 \times 8 = \419.92
- d. $\$18.18 \div 4 = \$4.545 = \$4.55$
6. a. $\frac{4}{5} = 0.8$
- b. $\frac{2}{3} = 0.\dot{6}$ or $0.\bar{6}$ ($0.\dot{6}$ or $0.\bar{6}$ means $0.666\dots$)
- c. $\frac{12}{21} = 0.571428571428\dots = 0.\dot{5}71428$
or $0.\overline{571428}$ ($0.\dot{5}71428$ means that 571428 is repeated.)
- d. $\frac{1}{6} = 0.16666 = 0.1\bar{6}$ or $0.1\dot{6}$
7. 15% of $40 = 0.15 \times 40 = 6$
8. 24% of $80 = 19.2$
9. a. $0.15 = 15\%$ b. $0.08 = 8\%$
- c. $0.1475 = 14.756\%$ or $14\frac{3}{4}\%$
- d. $0.155 = 15.5\%$ or $15\frac{1}{2}\%$

Note: To change any decimal to a percent, multiply by 100.
For example, $0.15 = 0.15 \times 100$
 $= 15\%$



Exploring Topic 1

Activity 1

State the reasons for saving money, and apply key words in banking to identify and compare the types of savings accounts.

1. Two of many reasons to save money are to buy a desired item, and to provide security for the unexpected.
2. For basic savings accounts, interest is calculated and paid twice a year. For daily interest savings accounts, interest is calculated each day and paid each month. Interest rates may vary between the two accounts.
3. A deposit is putting money into your account. A withdrawal is taking money out of your account.
4. Interest is money paid out by the bank on an account or a loan. A service charge is a fee that the bank charges for providing certain services to its customers.

Activity 2

Complete deposit and withdrawal slips.

1. A deposit slip is a form used to put money into an account.

2. A withdrawal slip is a form used to take money out of an account.
3. To endorse a cheque is to sign your name on the back of a cheque.

4. $\$12.00 + \$90.95 + \$64.00 + \$62.25 = \$229.20$

5.

THE BANK OF ALBERTA		CASH	
DATE <i>Sept. 20, 1989</i>	ACCOUNT NUMBER <i>466-88-99</i>	CHEQUES AND/OR COUPONS	$\$ 75 \quad 85$ $\$ 95 \quad 20$
CREDIT ACCOUNT OF <i>Maurry Tymchuk</i>			
INITIALS DEPOSITOR <i>M.T.</i>	TELLER	SUB-TOTAL	$\$171 \quad 05$
		LESS CASH	$\$ 50 \quad 00$
		NET DEPOSIT	$\$121 \quad 05$
		CASH RECEIVED - SIGNATURE <i>Maurry Tymchuk</i>	

6. a. Thirty ----- $\frac{75}{100}$
b. One hundred seven ----- $\frac{00}{100}$
c. Five thousand eight hundred seventy-five ----- $\frac{50}{100}$

7.

SAVINGS WITHDRAWAL	August 14	19 89
RECEIVED		
FROM THE BANK OF ALBERTA	\$	217.50
Two hundred seventeen <u>50</u> DOLLARS		
100		
ACCOUNT NUMBER	1-254376	John Clark
(Please sign in presence of Teller)		

Activity 3

Examine service charges associated with savings accounts.

1. A service charge is a fee that a bank charges its customers for services offered.

2. 3 cheques at \$2.00 per cheque = \$6.00
plus 3 - 2 = 1 transfer at \$1.25 = \$1.25

Total service charge = \$7.25

Activity 4

Balance a savings account.

1. a. $\$371.21 + \$9.29 + \$59.65 = \440.15
b. $\$652.15 + \$26.58 - \$125.00 = \553.73
c. $\$795.30 + \$20.70 = \$816.00$
2. $\$635.15 + \$85.75 + \$8.80 = \729.70

The new balance in Ken's account is \$729.70.

3. $\$2462.30 + \$80.08 + \$54.88 - \$2575.00 + \$13.86 + \$54.50 + \$54.50 = \145.12

The new balance on Eleanor's account is \$145.12.

Extra Help

1.

The First Bank Bank of Kings		Savings Account	
Account No. 12345 (A)		Date <i>Nov. 18, 1989</i> (B)	
Credit <i>GEORGE WILLIAM</i> (C)		Deposited by <i>GEORGE WILLIAM</i> (C)	
Cheques	Cash	Dollars	Cents
(G) \$25 00	7 (D) x 1	\$ 7	00 (E)
\$ 6 73	x 2		
	3 (D) x 5	\$15	00 (E)
	2 (D) x 10	\$20	00 (E)
	x 20		
	x		
	x		
	Coin		
Coupons Total/Cash & Coupons		\$42	00 (F)
▲		\$31	73 (H)
Sub-total			
Less cash received deducted from this deposit			
Customer's Signature Please sign in presence of Teller		<div style="border: 1px solid black; padding: 2px; display: inline-block;">\$73 73</div> (I)	
Teller's Initials		<div style="border: 1px solid black; padding: 2px; display: inline-block;">▲</div> Net Deposit	

2.

The First Bank		Savings Department	
Bank of Kings			
Received from the Bank of Kings		(S) Dec. 12 19 89	
(U) Twenty-five	Draw in a wavy line to fill out any excess space	(T) \$ 25.00	(V) 00 Dollars
Charge to Account No. 12345	(W) George Williams	(X)	

The Pass Book must be presented with this receipt

3.

True Savings Account		The First Bank	
12345		Bank of Kings	
Account Number		Main	
897-0000		Branch	
Telephone Number			

Date/19 83	Particulars	Withdrawal	Deposit	Balance	Initials
Aug 15	fund.			\$375 68	
Aug 15			\$62 45	\$438 13	JP
Oct 31	int.		\$9 28	\$447 41	
Nov 18			(M) \$73 73	(N) \$521 14	r
Dec 12		(P) \$25 00		(Q) \$496 14	u

Extensions

1.

H.I. Finance 23 Skidoo Place Anywhere, Alberta	March 12 19 83	Cheque Number 325
Pay to the Order of <u>Paul's Shoes</u>	\$	24.95
<u>Twenty-four</u>		95/100 Dollars
The Happy Bank 123 Happy Drive Anywhere, Alberta		H. I. Finance
123 ■ ■ 45678 ■ 901 ■ ■ 23 45678 ■		

2.

H.I. Finance 23 Skidoo Place Anywhere, Alberta	March 25 19 83	Cheque Number 326
Pay to the Order of <u>Food Market</u>	\$	126.89
<u>One hundred twenty-six</u>		89/100 Dollars
The Happy Bank 123 Happy Drive Anywhere, Alberta		H. I. Finance
123 ■ ■ 45678 ■ 901 ■ ■ 23 45678 ■		

3.

H.I. Finance 23 Skidoo Place Anywhere, Alberta	April 1 19 83	Cheque Number 327
Pay to the Order of	Ace Finance Company	\$ 325.00
	Three hundred twenty-five	00 Dollars 100
The Happy Bank 123 Happy Drive Anywhere, Alberta	H. I. Finance	
123 ■ ■ 45678 ■ 901 ■ ■ 23 ■ 45678 ■		

4.

H.I. Finance 23 Skidoo Place Anywhere, Alberta	April 6 19 83	Cheque Number 328
Pay to the Order of	Charge-it Card	\$ 142.29
	One hundred forty-two	29 Dollars 100
The Happy Bank 123 Happy Drive Anywhere, Alberta	H. I. Finance	
123 ■ ■ 45678 ■ 901 ■ ■ 23 ■ 45678 ■		

5.

H.I. Finance
23 Skidoo Place
Anywhere, Alberta

April 8 19 83

Cheque
Number 329

Pay to the
Order of

Electric Power Co.

\$ 25.38

Twenty-five $\frac{38}{100}$ Dollars

CANCELLED

The Happy Bank
123 Happy Drive
Anywhere, Alberta

H. I. Finance

|| 123 || ■ ■ 45678 || 901 ■ ■ 23 || 45678 || ■

6. a. April 1989

Worksheet

Paycheque	Other Income	Loan Payment	Food	Housing and Utilities	Medical	Personal	Insurance
\$1460.00		\$273.50	\$ 53.78	\$495.00		\$10.79	
\$ 485.00		\$ 50.73	\$ 74.12	\$ 9.25			
\$1945.00		\$324.23	\$ 84.13	\$ 44.17			
			\$ 98.50	\$ 53.95			
			\$310.53	\$602.37			
Allowances	Household	Transportation	Entertainment	Clothing	Gifts and Donations	Service Charges	Miscellaneous
\$ 25.00	\$8.73	\$31.00	\$ 6.00	\$142.16	\$10.00		\$14.20
\$ 25.00		\$22.11	\$ 8.00				
\$ 25.00		\$19.73	\$14.00				
\$ 25.00		\$72.84					
\$100.00							

May 1989

Worksheet

Paycheque	Other Income	Loan Payment	Food	Housing and Utilities	Medical	Personal	Insurance
\$1460.00	\$15.00	\$273.50	\$ 68.12	\$495.00	\$ 30.00		\$128.00
\$ <u>453.00</u>			\$ 71.16	\$ 9.25	\$102.00		
\$1913.00			\$ <u>96.72</u>	\$ 43.97	\$ <u>85.00</u>		
			\$236.00	\$ <u>55.68</u>	\$217.00		
				\$603.90			
Allowances	Household	Transportation	Entertainment	Clothing	Gifts and Donations	Service Charges	Miscellaneous
\$ 25.00		\$31.00	\$ 5.00	\$34.60	\$28.75	\$1.50	\$8.00
\$ 25.00		\$23.65	\$18.00		\$10.00		
\$ 25.00		\$ <u>19.40</u>	\$23.00		\$38.75		
\$ <u>25.00</u>		\$74.05					
\$100.00							

b. The total differences for April and May are as follows:

April 1989

Total income: \$1945.00
 Expenditures: \$1609.85
 Difference: \$ 335.15

May 1989

Total income: \$1928.00
 Expenditures: \$1739.30
 Difference: \$ 188.70

c. $\$335.15 + \$188.70 = \$523.85$

The total savings over the two-month period is \$523.85.



Exploring Topic 2

Activity 1

Change days and months into fractions of years.

1. a. 8 months = $\frac{8}{12} = \frac{2}{3}$ year
- b. 2 months = $\frac{2}{12} = \frac{1}{6}$ year
- c. 42 months = $\frac{42}{12} = \frac{21}{6} = \frac{7}{2}$ year
- d. 30 days = $\frac{30}{365} = \frac{6}{73}$ year
- e. 120 days = $\frac{120}{365} = \frac{24}{73}$ year
- f. 300 days = $\frac{300}{365} = \frac{60}{73}$ year

Activity 2

Calculate simple interest.

1. a. $I = Prt$
 $I = \$2200 \times 0.0875 \times 7$
 $I = \$1347.50$
 (Note: $8\frac{3}{4}\% = 8.75\%$
 $= 0.0875$)

The interest for this situation is \$1347.50.

b. $I = Prt$

$$I = \$5000 \times 0.14 \times \frac{16}{12}$$

$$I = \$5000 \times 0.14 \times \frac{4}{3}$$

$$I = \frac{\$2800}{3}$$

$$I = \$933.33$$

The interest in this case is \$933.33.

c. $I = Prt$

$$I = \$750 \times 0.125 \times \frac{36}{365}$$

$$I = \frac{\$3375}{365}$$

$$I = \$9.25$$

The interest here would be \$9.25.

2.

$$I = Prt$$

$$\$5023 = P \times 0.07 \times 3$$

$$\$5023 = 0.21P$$

$$P = \$5023 \div 0.21$$

$$P = \$23\,919.05$$

The principal in this case would be \$23 919.05.

3. $I = Prt$

$$\$1533 = \$3000 \times r \times 7$$

$$\$1533 = \$21\,000r$$

$$r = \$1533 \div \$21\,000$$

$$r = 0.073$$

$$r = 7.3\%$$

The rate of interest here would be 7.3%.

4. $I = Prt$

$$\$517.50 = \$575.00 \times 0.10 \times t$$

$$\$517.50 = \$57.5t$$

$$t = \$517.50 \div \$57.5$$

$$t = 9$$

The time would be 9 years.

Activity 3

Calculate compound interest through repeated simple interest.

1. a. $I = Prt$

$$I = \$1900 \times 0.12 \times 0.25$$

$$I = \$57.00$$

For the first compounding period, the interest is \$57.00.

$$I = Prt$$

$$I = \$1957 \times 0.12 \times 0.25$$

$$I = \$58.71$$

For the second compounding period, the interest is \$58.71.

b. $I = Prt$

$$I = \$750 \times 0.10 \times 0.08333$$

$$I = \$6.25$$

For the first compounding period, the interest is \$6.25.

$$I = Prt$$

$$I = \$756.25 \times 0.10 \times 0.08333$$

$$I = \$6.30$$

For the second compounding period, the interest is \$6.30.

c. $I = Prt$

$$I = \$1800 \times 0.0625 \times 0.5$$

$$I = \$56.25$$

For the first compounding period, the interest is \$56.25.

$$I = Prt$$

$$I = \$1856.25 \times 0.0625 \times 0.5$$

$$I = \$58.01$$

For the second compounding period, the interest is \$58.01.

2. Total interest for a is $\$57.00 + \$58.71 = \$115.71$.
 Total interest for b is $\$6.25 + \$6.30 = \$12.55$.
 Total interest for c is $\$56.25 + \$58.01 = \$114.26$

Activity 4

Calculate compound interest by using tables or a computer.

1. a. Step 1: $5\% \div 1 = 5\%$

Step 2: $7 \times 1 = 7$

Step 3: 1.4071 (from the table)

Step 4: $\$200 \times 1.4071 = \281.42

Step 5: $\$281.42 - \$200.00 = \$81.42$

The compound interest earned would be \$81.42.

- b. Step 1: $7\% \div 1 = 7\%$

Step 2: $10 \times 1 = 10$

Step 3: 1.9672 (from the table)

Step 4: $\$7000 \times 1.9672 = \$13\,770.40$

Step 5: $\$13\,770.40 - \$7000.00 = \$6770.40$

The compound interest earned would be \$6770.40.

- c. Step 1: $10\% \div 2 = 5\%$

Step 2: $2 \times 2 = 4$

Step 3: 1.2155 (from the table)

Step 4: $\$400.00 \times 1.2155 = \486.20

Step 5: $\$486.20 - \$400.00 = \$86.20$

The compound interest earned would be \$86.20.

- d. Step 1: $8\% \div 2 = 4\%$

Step 2: $9 \times 2 = 18$

Step 3: 2.0258 (from the table)

Step 4: $\$575.00 \times 2.0258 = \1164.84

Step 5: $\$1164.84 - \$575.00 = \$589.84$

The compound interest earned would be \$589.84.

- e. Step 1: $8\% \div 4 = 2\%$

Step 2: $6 \times 4 = 24$

Step 3: 1.6084 (from the table)

Step 4: $\$2000.00 \times 1.6084 = \3216.80

Step 5: $\$3216.80 - \$2000.00 = \$1216.80$

The compound interest earned would be \$1216.80.

Extra Help

1. a. $I = Prt$
 $I = \$12\,300 \times 0.1275 \times 4.25$
 $I = \$6665.06$

The interest is \$6665.06, and the amount is
 $\$12\,300 + \$6665.06 = \$18\,965.06$.

- b. $I = Prt$
 $I = \$293.65 \times 0.0175 \times 23$
 $I = \$118.19$

The interest is \$118.19, and the amount is
 $\$293.65 + \$118.19 = \$411.84$.

- c. $I = Prt$
 $I = \$31\,635 \times 0.001875 \times 157$
 $I = \$9312.55$

The interest is \$9312.55, and the amount is
 $\$31\,635 + \$9312.55 = \$40\,947.55$.

Extensions

1. Method 1: Simple interest repeated
First period

$$I = Prt$$
$$I = \$4500 \times 0.14 \times 0.5$$
$$I = \$315.00$$

Second period

$$I = Prt$$
$$I = \$4815 \times 0.14 \times 0.5$$
$$I = \$337.05$$

Third period

$$I = Prt$$
$$I = \$5152.05 \times 0.14 \times 0.5$$
$$I = \$360.64$$

Total interest is $\$315.00 + \$337.05 + \$360.64 = \1012.69 .

Method 2: Compound interest table

- Step 1: $14\% \div 2 = 7\%$
Step 2: $1\frac{1}{2} \times 2 = 3$
Step 3: 1.2250 (from the table)
Step 4: $\$4500 \times 1.2250 = \5512.50
Step 5: $\$5512.50 - \$4500 = \$1012.50$

Total interest earned is \$1012.50.

Method 3: Formula

$$A = P(1+i)^n$$

$$A = \$4500(1 + 0.07)^3$$

$$A = \$4500(1.07)^3$$

$$A = \$4500(1.225043)$$

$$A = \$5512.6935$$

$$A = \$5512.69$$

$$\text{Interest earned is } \$5512.69 - \$4500 = \$1012.69.$$

Comparison of the three methods

$$\text{Method 1} = \$1012.69$$

$$\text{Method 2} = \$1012.50$$

$$\text{Method 3} = \$1012.69$$

As you can see, all the answers are very close.

2. Method 1: Simple interest repeated

First period

$$I = Prt$$

$$I = \$10\,250 \times 0.14 \times 0.25$$

$$I = \$358.75$$

Second period

$$I = Prt$$

$$I = \$10\,608.75 \times 0.14 \times 0.25$$

$$I = \$371.31$$

Third period

$$I = Prt$$

$$I = \$10\,980.06 \times 0.14 \times 0.25$$

$$I = \$384.30$$

Fourth period

$$I = Prt$$

$$I = \$11\,364.36 \times 0.14 \times 0.25$$

$$I = \$397.75$$

Fifth period

$$I = Prt$$

$$I = \$11\,762.11 \times 0.14 \times 0.25$$

$$I = \$411.67$$

Total interest is

$$\$358.75 + \$371.31 + \$384.30 + \$397.75 + \$411.67 = \$1923.78.$$

Method 2: Compound interest table

$$\text{Step 1: } 14\% \div 4 = 3.5\%$$

$$\text{Step 2: } 1\frac{1}{4} \times 4 = 5$$

$$\text{Step 3: } 1.1877 \text{ (from the table)}$$

$$\text{Step 4: } \$10\,250 \times 1.1877 = \$12\,173.93$$

$$\text{Step 5: } \$12\,173.93 - \$10\,250 = \$1923.93$$

The interest earned is \$1923.93.

Method 3: Formula

$$A = P(1+i)^n$$

$$A = \$10\,250(1+0.035)^5$$

$$A = \$10\,250(1.035)^5$$

$$A = \$10\,250(1.187\,686\,306)$$

$$A = \$12\,173.784\,63$$

$$A = \$12\,173.78$$

$$i = \$12\,173.78 - \$10\,250 = \$1923.78$$

Total interest earned is \$1923.78.

Comparison of the three methods

Method 1 = \$1923.78

Method 2 = \$1923.93

Method 3 = \$1923.78

As you can see, all the amounts are quite close.



Exploring Topic 3

Activity 1

Define, examine, and compare other savings investments such as term deposits, savings bonds, Treasury Bills (T-Bills), and Registered Retirement Savings Plans.

1. a. i. $I = Prt$
 $I = \$2000 \times 0.105 \times 1$
 $I = \$210$
 $A = \$2210$
- ii. $I = Prt$
 $I = \$2210 \times 0.105 \times 1$
 $I = \$232.05$
 $A = \$2442.05$
- iii. $I = Prt$
 $I = \$2442.05 \times 0.105 \times 1$
 $I = \$256.42$
 $A = \$2698.47$
- iv. The total interest earned is
 $\$2698.47 - \$2000.00 = \$698.47$.
- b. i. $I = Prt$
 $I = \$1700 \times 0.14 \times 1$
 $I = \$238.00$
 $A = \$1938.00$
- ii. $I = Prt$
 $I = \$1938 \times 0.14 \times 1$
 $I = \$271.32$
 $A = \$2209.32$
- iii. $I = Prt$
 $I = \$2209.32 \times 0.14 \times 1$
 $I = \$309.30$
 $A = \$2518.62$
- iv. The total interest earned is
 $\$2518.62 - \$1700.00 = \$818.62$.

c. i. $I = Prt$
 $I = \$18\,500 \times 0.1275 \times 1$
 $I = \$2358.75$

$A = \$20\,858.75$

ii. $I = Prt$
 $I = \$20\,858.75 \times 0.1275 \times 1$
 $I = \$2659.49$

$A = \$23\,518.24$

iii. $I = Prt$
 $I = \$23\,518.24 \times 0.1275 \times 1$
 $I = \$2998.58$

$A = \$26\,516.82$

iv. The total interest earned is
 $\$26\,516.82 - \$18\,500.00 = \$8016.82.$

2. a. $A = P(1+i)^n$
 $A = \$7500(1+0.115)^4$
 $A = \$7500(1.115)^4$
 $A = \$7500(1.545\,608\,4)$
 $A = \$11\,592.06$

The amount of her term deposit at maturity is \$11 592.06.

b. $I = A - P$
 $I = \$11\,592.06 - \7500.00
 $I = \$4092.06$

The interest earned totals \$4092.06.

3. a. $A = P(1+i)^n$
 $A = \$10\,000(1+0.085)^5$
 $A = \$10\,000(1.085)^5$
 $A = \$10\,000(1.503\,656\,69)$
 $A = \$15\,036.57$

The amount of the term deposit at maturity is \$15 036.57.

b. $I = A - P$
 $I = \$15\,036.57 - \$10\,000$
 $I = \$5036.57$

The interest earned at maturity is \$5036.57.

4. a. The rate, from the chart, is 9.75%.

b. $I = Prt$
 $I = \$8000 \times 0.0975 \times \frac{75}{365}$
 $I = \frac{\$58\,500}{365}$
 $I = \$160.27$

She earns \$160.27 when her term deposit matures.

5. a. The rate, from the chart, is 10.50%.

b. $I = Prt$

$$I = \$6500 \times 0.105 \times \frac{300}{365}$$

$$I = \frac{\$204\ 750}{365}$$

$$I = \$560.96$$

He earns \$560.96 when his term deposit matures.

6. a. $\$137.94 \times 50 = \6897.00

The redemption value was \$6897.00.

- b. $\$6897.00 - \$5000.00 = \$1897.00$

Joe earned \$1897.00 in interest.

7. a. $\$202.68 \times 75 = \$15\ 201.00$

The redemption value after 9 years would be \$15 201.00.

- b. $\$15\ 201.00 - \$7500.00 = \$7701.00$.

Mark earned \$7701.00 in interest.

8. a. $C = \frac{F}{1+rt}$

$$C = \frac{\$112\ 000}{1 + \frac{11.75}{100} \times \frac{91}{365}}$$

$$C = \frac{\$112\ 000}{1 + \frac{10.69.25}{36\ 500}}$$

$$C = \frac{\$112\ 000}{1 + 0.029\ 294\ 52}$$

$$C = \frac{\$112\ 000}{1.029\ 294\ 52}$$

$$C = \$108\ 812.39$$

The cost would be \$108 812.39.

- b. $I = \$112\ 000 - \$108\ 812.39$

$$I = \$3187.61$$

Joe would earn \$3187.61 in interest.

$$9. \quad a. \quad C = \frac{F}{1 + rI}$$

$$C = \frac{\$37\,000}{1 + \frac{10.5}{100} \times \frac{182}{365}}$$

$$C = \frac{\$37\,000}{1 + \frac{1911}{36\,500}}$$

$$C = \frac{\$37\,000}{1 + 0.052\,356\,164}$$

$$C = \frac{\$37\,000}{1.052\,356\,164}$$

$$C = \$35\,159.20$$

The T-Bill would cost \$35 159.20.

$$b. \quad I = \$37\,000 - \$35\,159.20$$

$$I = \$1840.80$$

Belinda would earn \$1840.80 in interest.

10. The maximum contribution is 20% of income.

$$\begin{aligned} \$35\,500 \times 20\% &= \$35\,500 \times 0.20 \\ &= \$7100.00 \end{aligned}$$

John's maximum R.R.S.P. contribution is \$7100.00.

11. The maximum contribution is 20% of income.

$$\begin{aligned} \$76\,000 \times 20\% &= \$76\,000 \times 0.20 \\ &= \$15\,200 \quad (\text{The maximum allowable is } \$7500.) \end{aligned}$$

Henry John can invest \$7500, the maximum allowable contribution.

12. Maximum is 20% of earned income (up to \$3500) less any company pension plan contributions.

$$\$13\,000 \times 0.20 = \$2600.00$$

$$\$2600 - \$850 = \$1750$$

Jules Smith can invest \$1750 in a R.R.S.P.

13. The maximum is 20% of earned income (up to \$3500) less any company pension plan contributions.

$$\$32\,000 \times 0.20 = \$6400 \quad (\text{Maximum is } \$3500.)$$

$$\$3500 - \$2100 = \$1400.00$$

Marie Brosseau can invest \$1400 in a R.R.S.P.

Extra Help

$$1. \quad a. \quad A = P(1+i)^n$$

$$A = \$3567(1 + 0.0475)^{12}$$

$$A = \$3567(1.0475)^{12}$$

$$A = \$3567(1.745\,212\,76)$$

$$A = \$6225.17$$

$$I = \$6225.17 - \$3567.00$$

$$I = \$2658.17$$

\$2658.17 would be earned in interest.

b. $A = P(1+i)^n$

$$A = \$10\,043(1+0.028\,125)^8$$

$$A = \$10\,043(1.028\,125)^8$$

$$A = \$10\,043(1.248\,439\,086)$$

$$A = \$12\,538.07$$

$$I = \$12\,538.07 - \$10\,043.00$$

$$I = \$2495.07$$

\$2495.07 would be earned in interest.

c. $A = P(1+i)^n$

$$A = \$105\,600(1+0.0225)^{18}$$

$$A = \$105\,600(1.0225)^{18}$$

$$A = \$105\,600(1.492\,587\,156)$$

$$A = \$157\,617.20$$

$$I = \$157\,617.20 - \$105\,600.00$$

$$I = \$52\,017.20$$

\$52 017.20 would be earned in interest.

Extensions

- 1500 shares sold.
- The closing price was $4\frac{1}{2}\phi$.
- The daily low was 285 ϕ .
- The previous day's closing price was 295 ϕ – 16 ϕ = 279 ϕ .
- $\$7\frac{3}{8} = \$7 + \$\frac{3}{8} = \$7 + \$0.375$
= \$7.375
- Commission rate is 2% + \$0.05 since each share costs $\$6\frac{7}{8}$.

Price of 300 shares is

$$300 \times \$6.875 = \$2062.50.$$

$$\begin{aligned}\text{Commission} &= (2\% \text{ of } \$2062.50) + (\$0.05 \times 300) \\ &= \$41.25 + \$15.00 \\ &= \$56.25\end{aligned}$$

$$\text{Selling price} = \underline{\$2062.50} - \underline{\$56.25} = \underline{\$2006.25}$$

The selling price of shares of Worldwide Kites is \$2006.25.



Exploring Topic 4

7. Commission rate is $1\% + \$0.20$ per share.

Price of 500 shares is

$$500 \times \$29\frac{1}{2} = \$14\,750.00.$$

$$\begin{aligned}\text{Commission} &= (1\% \text{ of } \$14\,750) + (\$0.20 \times 500) \\ &= \$147.50 + \$100.00 \\ &= \$247.50\end{aligned}$$

$$\text{Buying price} = \underline{\$14\,750.00} + \underline{\$247.50} = \underline{\$14\,997.50}$$

The buying price of 500 shares of CM & M is \$14 997.50.

8. Price = $300 \times \$14 = \4200

$$\begin{aligned}\text{Commission} &= 2[(2\% \text{ of } \$4200) + (\$0.05 \times 300)] \\ &= 2[\$84.00 + \$15.00] \\ &= 2[\$99.00] \\ &= \$198.00\end{aligned}$$

The total commission collected by the stockbroker is \$198.00.

Activity 1

Define the terms associated with a chequing account.

1. Any chequing account allows the holder to write an unlimited number of cheques.
2. A cheque book register is a record of cheques written and the balance of money in the account after each cheque has been written or a deposit has been made.
3. When an account is overdrawn, a cheque has been written on money which is not in the account.
4. NSF stands for Not Sufficient Funds.
5.
 - charge per cheque written
 - charge for withdrawing money
 - charge for an NSF cheque
 - charge for a certified cheque
6. The cheque is guaranteed not to bounce. The bank makes sure that the account has enough funds to cover the amount of the cheque.

Activity 2

Compare different types and features of chequing accounts.

1. The two main types of chequing accounts are a straight chequing account and a savings/chequing account.
2. The straight chequing account is better because it provides features that a savings/chequing account does not have. Such features include overdraft protection or the return of cancelled cheques which can be used as proof that payment has been made.

Activity 3

Examine the service charges associated with chequing accounts.

1. The seven most common features are as follows:

- no charge for writing cheques
- overdraft protection
- no service charge for travellers' cheques
- no service charge for money orders
- no charge for certified cheques
- no service charge for a safety deposit box
- no charge for paying utility bills

2. To write 11 cheques, Jane would be charged $11 \times 25\text{¢} = \$2.75$. So, the \$2.00 flat rate per month would be better for her since she would save 75¢ using the monthly rate.

3. a. Cheques: $34 \times 32\text{¢} = \$10.88$
Withdrawals: $10 \times 40\text{¢} = \$4.00$
Utility bills: $9 \times 50\text{¢} = \$4.50$

Total = $\$10.88 + \$4.00 + \$4.50 = \19.38

The total fee would be \$19.38.

- b. Cheques: $19 \times 32\text{¢} = \$6.08$
Withdrawals: $10 \times 40\text{¢} = \$4.00$
Utility bills: $9 \times 50\text{¢} = \$4.50$
Overdrafts: $3 \times \$2.50 = \7.50

Total = $\$6.08 + \$4.00 + \$4.50 + \$7.50 = \$22.08$

The total fee would be \$22.08.

Extra Help

1. Cheques: $20 \times 32\text{¢} = \$6.40$
Withdrawals: $12 \times 40\text{¢} = \$4.80$
Utility bills: $12 \times 50\text{¢} = \$6.00$
Overdrafts: $3 \times \$2.50 = \7.50

$\$6.40 + \$4.80 + \$6.00 + \$7.50 = \$24.70$

The total amount of service fees is \$24.70.

2. Cheques: $19 \times 32¢ = \$6.08$
 Withdrawals: $14 \times 40¢ = \$5.60$
 Utility bills: $12 \times 50¢ = \$6.00$
 Overdrafts: $4 \times \$2.50 = \10.00
 $\$6.08 + \$5.60 + \$6.00 + \$10.00 = \$27.68$
 The total amount of service fees is \$27.68.

Extensions

1. May - Credits:

$$\$469.36 + \$1453.63 = \$1922.99$$

Debits:

$$\$239.60 + \$436.67 + \$115.63 + \$0.96 + \$1.50 = \$794.36$$

(The \$0.96 is for the service fee on the three cheques that were written. \$1.50 is the service fee for the three utility bills.)

Balance:

$$\$1922.99 - \$794.36 = \$1128.63$$

- June - Credits:

$$\$1128.63 + \$1453.63 = \$2582.26$$

(\$1128.63 is the balance from the previous month.)

Debits:

$$\$239.60 + \$243.60 + \$123.60 + \$0.96 + \$1.50 = \$609.26$$

Balance:

$$\$2582.26 - \$609.26 = \$1973.00$$

- July - Credits:

$$\$1973.00 + \$1463.63 + \$363.50 = \$3800.13$$

Debits:

$$\$239.60 + \$369.37 + \$95.63 + \$0.96 + \$1.50 = \$707.06$$

Balance:

$$\$3800.13 - \$707.06 = \$3093.07$$

- August - Credits:

$$\$3093.07 + \$1463.63 + \$265.35 = \$4822.05$$

Debits:

$$\$239.60 + \$279.55 + \$83.63 + \$65.00 + \$150.00 + \$1.60 + \$1.50 = \$820.88$$

Balance:

$$\$4822.05 - \$820.88 = \$4001.17$$

- September - Credits:

$$\$4001.17 + \$1463.63 = \$5464.80$$

Debits:

$$\$105.34 + \$456.39 + \$123.64 + \$936.42 + \$1.28 + \$1.50 = \$1624.57$$

Balance:

$$\$5464.80 - \$1624.57 = \$3840.23$$

October - Credits:

$$\$3840.23 + \$1463.63 + \$1100.00 = \$6403.86$$

Debits:

$$\begin{aligned} \$389.60 + \$163.40 + \$3960.42 + \$463.42 + \$1.28 \\ + \$1.50 = \$4979.62 \end{aligned}$$

Balance:

$$\$6403.86 - \$4979.62 = \$1424.24 \text{ (plus interest)}$$

The lowest bank balance for this 6-month period will be assumed to be \$469.36 from May. The interest will be calculated on this amount.

Interest: $I = Prt$

$$I = \$469.36 \times 0.09 \times \frac{1}{2}$$

$$I = \$21.12$$

The final balance for this 6-month period is
 $\$1424.24 + \$21.12 = \$1445.36$.

2. July - Credits:

$$\$2063.95 + \$500.00 + \$1450.00 = \$4013.95$$

Debits:

$$\begin{aligned} \$655.10 + \$306.39 + \$76.42 + \$200.00 + \$60.00 \\ + \$69.53 + \$3.00 + \$1.50 = \$1371.94 \end{aligned}$$

Balance:

$$\$4013.95 - \$1371.94 = \$2642.01 \text{ (plus interest)}$$

$I = Prt$

$$I = \$2642.01 \times 0.09 \times \frac{1}{12}$$

$$I = \$19.82$$

Final balance:

$$\$2642.01 + \$19.82 = \$2661.83$$

August - Credits:

$$\$2661.83 + \$500.00 + \$1450.00 = \$4611.83$$

Debits:

$$\begin{aligned} \$43.00 + \$263.00 + \$45.00 + \$84.39 + \$1.50 + \$1.50 \\ = \$438.39 \end{aligned}$$

Balance:

$$\$4611.83 - \$438.39 = \$4173.44 \text{ (plus interest)}$$

$I = Prt$

$$I = \$4173.44 \times 0.09 \times \frac{1}{12}$$

$$I = \$31.30$$

Final balance:

$$\$4173.44 + \$31.30 = \$4204.74$$

September - Credits:

$$\$4204.74 + \$500.00 + \$1450.00 + \$936.45 = \$7091.19$$

Debits:

$$\begin{aligned} & \$13.65 + \$267.14 + \$366.93 + \$89.16 + \$550.00 \\ & + \$3.00 + \$1.50 = \$1291.38 \end{aligned}$$

Balance:

$$\$7091.19 - \$1291.38 = \$5799.81 \text{ (plus interest)}$$

$$I = Prt$$

$$I = \$5799.81 \times 0.09 \times \frac{1}{12}$$

$$I = \$43.50$$

Final balance:

$$\$5799.81 + \$43.50 = \$5843.31$$

The final balance at the end of this period is
\$5843.31.



Exploring Topic 5

Activity 1

Complete cheques, deposit slips, and withdrawals slips.

1.

National Bank	
PAY TO THE ORDER OF <i>The Western Bike Shop</i>	Aug. 25 19 88 \$ 165.50
One hundred sixty-five 50 <small>DOLLARS</small> <small>100</small>	
NO. 202	<i>Harvey Wentworth</i>
08040 070	

2.

ALBERTA BANK		DEPOSIT	
THE BANK OF ALBERTA			
DATE <i>Feb. 6, 1989</i>	DEPOSITOR'S INITIALS <i>M.D.</i>	CASH \$ 12 50 CHEQUES/ COUPONS \$1025 37	SUB TOTAL \$1037 87
SIGNATURE - CASH RECEIVED <i>Mark Dollars</i>		LESS CASH \$ 237 00	AMOUNT \$ 800 87
BRANCH NO.	ACCOUNT NO. 364103	NAME - (PLEASE PRINT) MARK DOLLARS	

3.

ALBERTA BANK	WITHDRAWAL	May 9 19 89
RECEIVED FROM	The Bank of Alberta	
	\$ 123.60	
	One hundred twenty-three	60 DOLLARS
ACCOUNT NO. 5634004	Jane Whistle	
	(PLEASE SIGN IN FRONT OF BANK OFFICER)	

4. A chequing account deposit slip is signed when cash is taken out at the time of deposit.

Activity 2

Keep personal records of cheques written and deposits made.

1. a.

Balance	\$ 172	50
Deposit	\$	
Total	\$ 172	50
Cheque	\$ 46	95
Balance	\$ 125	55

b.

Balance	\$ 359	30
Deposit	\$ 62	45
Total	\$ 421	75
Cheque	\$ 289	75
Balance	\$ 132	00

2. Balance forward = \$126.80
 Deposit = +\$ 80.50
 Deposit = +\$ 20.30
Total = \$227.60
 Cheque = -\$120.00
 Balance = \$107.60

3.

AMOUNT OF CHEQUE	AMOUNT OF DEPOSIT	BALANCE
BALANCE BROUGHT FORWARD		
\$ 84 60		\$269 80
		\$185 20
	\$105 00	\$290 20
\$100 00		\$190 20

4.

CHEQUE NO.	DATE	PARTICULARS	AMOUNT OF CHEQUE	✓	AMOUNT OF DEPOSIT	BALANCE
	8/18	BALANCE FORWARD				\$476 90
462	8/26	FOOD MARY	\$115 30			\$361 60
463	9/5	PHONE BILL	\$ 76 30			\$285 30
	9/14	CASH ADVANCE			\$300 00	\$585 30
464	9/15	TELEPHONE	\$112 50			\$472 80
465	9/26	MARY'S ELECTRICAL	\$230 00			\$242 80
	9/30	WORK CHEQUE			\$550 00	\$792 80

Activity 3

Reconcile a bank statement with personal records.

1. The previous balance was \$428.32.
2. The service charge was \$0.75.
3. The total credits were \$597.36.
4. Two deposits were made at a banking machine.
5. The account number is 215-403.
6. The cheque number is 342.
7. The balance after the transfer was made was \$499.77.
8. a. $\$572.75 + \$76.25 + \$128.50 - \$51.20 - \$18.95 - \$151.00 = \$556.35$
 $\$562.85 - \$6.50 = \$556.35$
The true amount is \$556.35.
- b. $\$123.51 + \$75.00 + \$500.00 + \$130.25 - \$175.00 - \$279.95 = \$373.81$
 $\$375.31 - \$1.50 = \$373.81$
The true amount is \$373.81.

Extra Help

1. a.

Bank balance = \$ 436.05
 Outstanding deposits = \$1478.51
 Total = \$1914.56
 Outstanding cheques = \$ 378.19
 Total = \$1536.37

Cheque register balance = \$1549.00
 Service charge = \$ 12.63
 True amount = \$1536.37

The true amount in the account is \$1536.37.

b.

Bank balance = \$1066.39
 Outstanding deposits = \$ 975.37
 Total = \$2041.76
 Outstanding cheques = \$ 563.87
 Total = \$1477.89

Cheque register balance = \$1510.06
 Service charge = \$ 32.17
 True amount = \$1477.89

The true amount in the account is \$1477.89.

c.

Bank balance = \$3301.46
 Outstanding deposits = \$1629.47
 Total = \$4930.93
 Outstanding cheques = \$1061.70
 Total = \$3869.23

Cheque register balance = \$3923.18
 Service charge = \$ 53.95
 True amount = \$3869.23

The true amount in the account is \$3869.23.

2. a. A service charge is a fee that the bank charges for taking care of an account.

b. Interest is money earned on deposits or money paid on loans.

c. Principal is the amount on which interest is calculated.

d. A deposit slip is a form filled out when you put money into an account.

e. A passbook is a booklet which keeps a record of deposits, withdrawals, and balances.

f. A bank statement is a monthly list issued by the bank on which all transactions are entered during a particular time period (usually one month).

- g. A cheque register is the portion of a cheque book where entries are made whenever a withdrawal or a deposit is made. A balance is also updated after each entry.
- h. A withdrawal slip is a form which is filled out when money is taken out of an account.
- i. A cheque is a slip of paper used to pay for goods bought or services rendered.
- j. A certified cheque is a cheque that the bank guarantees will not bounce. The amount of the cheque is covered by an account, without a doubt.

2. $I = Prt$

$$\$945.70 = P \times 0.105 \times \frac{3}{2}$$

$$\$945.70 = P \times \frac{0.315}{2}$$

$$\$945.70 = \frac{0.315P}{2}$$

$$0.315P = \$1891.4$$

$$P = \$1891.4 \div 0.315$$

$$P = \$6004.44$$

The principal is approximately \$6004.44.

Extensions

1. $I = Prt$

$$I = \$3604.35 \times 0.0875 \times \frac{45}{12}$$

$$I = \frac{\$14\,192.128\,13}{12}$$

$$I = \$1182.68$$

The interest amounts to \$1182.68.

3. $I = Prt$

$$\$605.45 = \$3002.63 \times \frac{r}{100} \times 2$$

$$\$605.45 = \frac{\$6005.26r}{100}$$

$$\$6005.26r = \$60\,545$$

$$r = \$60\,545 \div \$6005.26$$

$$r = 10.081$$

$$r = 10.08\%$$

The rate is about 10.08%.

4.

$$I = Prt$$

$$\$507 = \$56\,345 \times 0.725 \times t$$

$$\$507 = \$4085.0125t$$

$$t = \$507 \div \$4085.0125$$

$$t = 0.124$$

$$t = 0.12$$

The time is approximately 0.12 years.

$$5. \bullet A = P(1+i)^n$$

$$A = \$10\,480(1+0.0525)^8$$

$$A = \$10\,480(1.0525)^8$$

$$A = \$10\,480(1.505\,833\,089)$$

$$A = \$15\,781.13$$

The amount is \$15 781.13, and the interest is
\$15 781.13 - \$10 480 = \$5301.13.

$$\bullet A = P(1+i)^n$$

$$A = \$15\,230(1+0.015)^{16}$$

$$A = \$15\,230(1.015)^{16}$$

$$A = \$15\,230(1.268\,985\,548)$$

$$A = \$19\,326.65$$

The amount is \$19 326.65, and the interest is
\$19 326 - \$15 230 = \$4096.65.

a. Investment #1 $i = \$5301.13$

The interest on this deposit is \$5301.13.

Investment #2 $i = \$4096.65$

The interest on this deposit is \$4096.65.

$$\$5301.13$$

$$\underline{\$4096.65}$$

$$\$9397.78$$

The total interest earned is \$9397.78.

b. \$15 781.13

$$\underline{\$19\,326.65}$$

$$\$35\,107.78$$

The total amount he had at the end of four years was
\$35 107.78.



Mathematics 24

9MA24P23

L.R.D.C.
Producer

SECOND EDITION
1990